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Subject Please Use Attached Risk Assessment Report

History:  This message has been forwarded.

Hi Chris - please delete the prior version of the Risk Assessment report transmitted late last Friday. I noticed a couple of typos, etc. during my review this morning, and have fixed them on the revised version which is attached.

I'm also working with GIS staff to resolve the technical difficulties with the Section 4 figures and will be transmitting them to you by the end of the day. Both reports are currently in production and the hard copies will be mailed at the end of the day also. If you have any questions, please feel free to call me at 949/930-2941.

Thanks,

Sharon



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**OMEGA CHEMICAL SITE PRP ORGANIZED GROUP**

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January 19, 2007

Mr. Chris Lichens  
Remedial Project Manager  
U.S. Environmental Project Manager Agency-Region IX  
75 Hawthorne Street (SFD-7-4)  
San Francisco, CA 94105

Re: Risk Assessment Report,  
Omega Chemical Superfund Site, Whittier, California

Dear Mr. Lichens:

Enclosed for your review is a copy of the Risk Assessment (RA) Report for the Omega Chemical Superfund Site. This RA report was prepared in accordance with Task 2 of the Statement of Work (SOW) in *Consent Decree No. 00-12471 between the United States Environmental Protection Agency (USEPA) and OPOG (USEPA, 2001)*. The Consent Decree was lodged on November 24, 2000 and entered into the US District Court on February 28, 2001.

Should you have any questions, regarding the above, please contact me.

Sincerely,  
Omega Chemical Site PRP Organized Group



Edward Modiano  
Project Coordinator

cc: Tom Perina, CH2MHIL  
Lori Paranass, DTSC  
Dave Chamberlin, CDM  
Sharon Wallin, CDM

Draft  
Human Health Risk Assessment for  
On-Site Soils

*Omega Chemical Superfund Site  
Whittier, California*

January 19, 2007

*Submitted to:*

U.S. Environmental Protection Agency  
Region IX

*Prepared for:*

Omega Chemical Site  
PRP Organized Group

*Prepared by:*

**CDM**

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# Section 1

## Introduction

### 1.1 Scope and Objectives

This risk assessment presents an evaluation of potential human health risks and hazards associated with exposure to residual soil and groundwater contamination at the former Omega Chemical site (the Site). The Site is located at 12504/12512 East Whittier Boulevard (Figure 1). Because the Site is located in an urban area that has been developed for decades, provides no suitable habitat, and contaminated subsurface soils are covered with buildings, asphalt, or concrete, ecological impacts from the facility are not expected and are not evaluated.

This Human Health Risk Assessment (HHRA) follows risk assessment guidance from United States Environmental Protection Agency (USEPA) and with accommodations for consistency with similar guidance from California EPA (CalEPA) as necessary. The following documents formed the basis for the HHRA:

- Risk Assessment Guidance for Superfund, Volume I: Human Health Evaluation Manual (Part A). Interim Final. EPA/5401/1-891002. December 1989.
- CalEPA Supplemental Guidance for Human Health Multimedia Risk Assessments of Hazardous Waste Sites and Permitted Facilities. July 1996.

### 1.2 USEPA Consent Decree

This HHRA has been prepared in accordance with Task 2 of the Statement of Work in Consent Decree No. 00-12471 between the United States Environmental Protection Agency (USEPA) and the Omega Chemical Site PRP Organized Group (OPOG). The Consent Decree was lodged on November 24, 2000 and entered into the US District Court on February 28, 2001.

Task 2 requires OPOG to “Implement a Vadose Zone Remedial Investigation/ Feasibility Study (RI/FS) For Contaminant Releases On, At, or Emanating From The Omega Property”. The Site location and vicinity are illustrated on Figure 1-1. The figure also illustrates the Phase 1a area, where a groundwater remedy is currently being implemented in accordance with Task 1 of the Consent Decree. The groundwater remedy is expected to be operational in mid-2007.

### 1.3 Site History

The following section is a summary of information regarding previous owners, operations, and known historical chemical use at and in the vicinity of the Site.

#### 1.3.1 Owners and Operators

The subject Site located at 12504/12512 East Whittier Boulevard was first developed in 1951. The Site occupies Los Angeles County Assessor Tract No. 13486, Lots 3 and 4.

The Site is approximately 41,000 square feet (~0.94 acres) in area (200 feet wide x 205 feet long) and contains two structures – an approximate 140 by 50 foot warehouse and an approximate 80 by 30 foot administrative building. A loading dock is also attached to the rear of the warehouse. The exterior areas are concrete-paved and the Site is secured with a perimeter fence and locking gate.

Prior to initial construction of buildings in July 1951, the Site was used for agriculture; apparently the site has never been used for residential purposes. The Site was operated by Sierra Bullets prior to 1963. During operation of the Sierra Bullet facility, a 500-gallon underground storage tank (UST) was utilized for storage of kerosene. The UST was subsequently removed in 1987 by Fred R. Rippy, Inc.

From 1976 to 1991 Omega Chemical Corporation operated a treatment and disposal facility for commercial and industrial solid and liquid wastes and a transfer station for storage and consolidation of wastes for shipment to other treatment and/or disposal facilities.

Van Owen Holdings LLC of Los Angeles, California purchased the property in 2003. Star City Auto Body occupies the warehouse (12504 Whittier Blvd.) and performs auto body repair and painting on the premises. The auto body shop also leases the small paved parking lot north of the warehouse building for automobile parking. The former paved parking lot north of the warehouse building (12512 Whittier Blvd.) and larger paved parking area south of the warehouse have had a variety of tenants since 2003. The former administration building is currently unoccupied, and the parking lot is used for temporary storage of wooden pallets by L&M Pallets on a month-to-month lease basis.

### **1.3.2 Facility Processes and Chemical Usage**

Limited information regarding volumes and types of wastes handled by the Omega Chemical Corporation is available for review. According to the Phase II Close Out Report (Hargis and Associates, England and Associates, October 1, 1996), Omega Chemical Corporation operated the facility for recycling and treatment of spent solvents and refrigerants. Drums and bulk loads of waste solvents and chemicals (primarily chlorinated hydrocarbons and chlorofluorocarbons) from various industrial activities were processed to form commercial products which were returned to generators or sold in the marketplace. An Operation Plan, prepared by Omega Chemical Corporation in 1990 for proposed expansion of the facility, provided a summary of current and proposed facility processes, tank capacities, incoming and facility-generated waste stream characteristics and handling practices, etc.

The majority of the 11 treatment units were located in the general area of the warehouse loading dock. As indicated in the Operation Plan, a total of 27 storage tanks with a combined storage capacity of 109,400 gallons were present at the facility in 1990. Six large, vertical storage tanks were arranged in an L-shaped pattern in the southern corner of the Site. Five process tanks were located in the northern yard, and

were arranged in a linear pattern along the side of the warehouse. The locations of the smaller storage tanks were not indicated in the Operation Plan.

Wastes accepted by Omega Chemical Corporation for recycling were broadly characterized as organic solvents and chemicals, and aqueous wastes with organic waste constituents. Sources of the incoming waste were a wide assortment of manufacturing and industrial processes (petroleum refining, rubber and plastics, chemicals, paper and allied products, furniture and fixture products, lumber and wood products, printing and publishing, textile mill products, food and kindred products, etc.).

The treatment and transfer activities at Omega resulted in releases of chemicals to soil, soil gas, and groundwater at the Site, as evidenced by the results of previous site investigations (the first conducted in 1985 by LeRoy and Crandall Associates regarding subsurface contamination at the tank farm). Adjacent facilities, including the Terra Pave facility and the former Cal-Air facility (now owned by Medlin & Son), may have also released contaminants to Site media. A removal action was performed at Terra Pave to address lead contamination in soil. It is possible that lead in airborne particulates from Terra Pave were deposited onto surface soils at the Site. Freon 113 results from the portion of the Omega Site nearest the former Cal-Air facility suggest the possibility of an off-site source.

The principal VOCs detected in the soil gas at the Omega site and at the highest concentrations were Freon 113, Freon 11, 1,1,1-TCA and PCE. The most prevalent contaminants detected in soil and groundwater are volatile organic compounds (VOCs), primarily tetrachloroethylene (PCE) and related compounds, trichloroethane (TCA), and freons. Chlorinated methane compounds, including methylene chloride and chloroform, as well as acetone and toluene, are also detected at the downgradient Site boundary and off-Site. No indications of dense non-aqueous phase liquids (DNAPLs) were identified in vadose zone soil; although some groundwater concentrations are indicative of either non-aqueous phase liquids (NAPL) or residual saturation of VOCs within or above the capillary fringe.

Material found within the loading dock sump contained the highest concentrations of VOCs found anywhere on-site. All loading dock sump material was excavated, transported to an USEPA-approved off-Site disposal facility, incinerated, and disposed. No other exposed or near-surface grossly contaminated materials were identified.

## 1.4 Potential Risk Issues

This HHRA addresses potential risks and hazards associated with residual soil contamination at the site. The HHRA evaluates the current and future use of the site for commercial purposes. Risk issues at the Site may include partitioning of volatile organic compounds (VOCs) from the soil matrix into soil gas and subsequently into ambient and indoor air. Because VOCs may accumulate to some extent indoors, inhalation of indoor air was quantitatively evaluated in the HHRA using measured

indoor air vapor concentrations. In addition to the Omega Site, potential for vapor intrusion was evaluated using indoor air data at the following areas:

- the parcel immediately to the north currently occupied by Medlin & Sons,
- the parcel immediately to the west currently occupied by TerraPave,
- the parcel to the south and west of the site (currently the occupied by the Bishop Company), and
- the parcel south of Bishop Company currently occupied by LA Carts and Oncology Care.

Also, the estimates for possible vapor intrusion for the parcel immediately to the south of the site (formerly the site of the Skateland facility) were based on measured concentrations of VOCs in soil gas since this building is in the process of being demolished.

Inhalation of ambient air was not evaluated for commercial workers because VOCs would be rapidly diluted. However, construction workers who work in areas where air flow is restricted (e.g., excavations), could theoretically be impacted.

In addition, construction workers at the Site may also be in direct contact with contaminated subsurface soil through incidental ingestion or dermal contact. These scenarios are evaluated in the HHRA for soil. The HHRA did not address these scenarios for soil at the above defined separate parcels. Soil data were concentrated on and along the border of the Omega site. The results of the risk assessment using available soil data were used to predict the likelihood of impacts on the surrounding parcels.

Currently, groundwater underlying the Site and in the immediate vicinity is not used for any purpose. Use for potable purposes within this area is also unlikely for the future due to the presence of high concentrations of total dissolved solids (TDS). However, risks from contaminated groundwater could theoretically result from volatilization of groundwater contaminants into ambient and indoor air, this possibility is highly unlikely due to the 30 foot clay layer boundary above the water table..

Currently, no plans exist for residential development at the Site, and the Site location suggests that residential development in areas adjacent to the Site is unlikely. Therefore, residential use of the site is not expected to occur in the future and, residential exposures are not significant risk issues. Section 3 provides a more detailed discussion of current and reasonable future land uses of the site.

## 1.5 Overview of Risk Assessment Findings

Results of the risk assessment suggest that contaminated soils at the site are unlikely to present a significant threat to either future construction or commercial/industrial workers. Cancer risk estimates fell in the range of less than to somewhat greater than  $1 \times 10^{-6}$ . Hazard indices slightly exceeded one for commercial/industrial workers and were less than one for construction workers. Exposures to soil are unlikely now and in the future because of current and expected cover of most of the site with hardscape (buildings, concrete, and asphalt).

Possible risks associated with exposure to vapors intruding into indoor air spaces are typically in the upper half of EPA's target risk range of  $1 \times 10^{-6}$  to  $1 \times 10^{-4}$  ( $1 \times 10^{-5}$  to  $8 \times 10^{-5}$ ). HI estimates fell in the range of less than one to about 5. Risks and hazards were estimated for the Omega site and for several surrounding parcels. VOCs in ambient air may account of 12 to essentially 100 percent of these risks depending on the parcel.

The basis for these risk estimates is provided in detail in the remainder of this report.

## 1.4 Report Organization

This HHRA was conducted in four phases as defined in Cal EPA and U.S. EPA guidance, including:

- Identification of chemicals of potential concern (COPCs) that exist in sufficient quantities to present a public health risk (Hazard Identification, Section 2)
- Analysis of ways in which people might be exposed to COPCs (Exposure Assessment, Section 3)
- Evaluation of the toxicity of COPCs that may present public health risks (Toxicity Assessment, Section 4)
- Characterization of the magnitude and location of potential health risks for the exposed community (Risk Characterization, Section 5)

Uncertainties, summary and conclusions, and references are provided in Sections 6, 7, and 8, respectively. Risk calculations are provided in Appendix A.

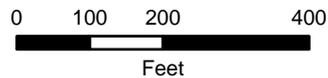
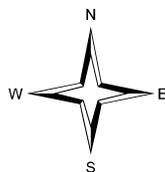


Omega Chemical Superfund Site



**Legend**

- Omega Chemical
- Phase Ia Area



**Site Location Map**

Figure 1-1

# Section 2

## Data Analysis and Identification of Chemicals of Potential Concern

This section presents a summary of data available for the HHRA, a summary of the data evaluation, and the selection of preliminary Chemicals of Potential Concern (COPCs). Chemicals selected as COPCs were evaluated quantitatively. Data used in the HHRA were obtained from recent sampling events conducted by CDM and include soil, soil gas, and indoor and ambient air samples. As previously discussed, groundwater underlying the Site and in the immediate vicinity is currently not used for any purpose nor is it likely to be used for potable use in the future due to high concentrations of TDS. Further, a groundwater remedy is expected to be operational in mid-2007. Groundwater exposure pathways are not directly evaluated in this risk assessment. However, any groundwater vapor off-gassing was considered by the direct collection of indoor air samples or, in the case of the former Skateland parcel, measured concentrations of VOCs in soil gas..

A preliminary data evaluation was performed to determine the usability of existing data for the HHRA. Selection of data used to support quantitative evaluation is based on quality, quantity, comparability (e.g., similar detection limits), and representativeness of data for current site conditions and potential exposures at the site. During data evaluation, a set of data appropriate for use in qualitative and quantitative risk assessment is compiled. These data are then used in selection of COPCs and in estimation of exposure point concentrations used in the calculation of possible chronic daily intake. A more extensive discussion of data quality is provided in the draft On-Site Soils RI Report, which has been submitted concurrently with this document (CDM, January 5, 2007).

### 2.1 Data to Support Human Health Risk Assessment

During the RI, samples were collected from surface soils, subsurface soils, soil gas, indoor air, and ambient air. Sample location maps and analytical summary tables for all samples collected during the RI are provided in the RI report. Please refer to the figures and tables provided in the RI report for sample locations and a summary of analytical results.

Approximately 208 soil samples of which 8 were duplicates were collected during roughly 13 sampling events from 1995 to 2006. Soil samples were collected at approximately 66 locations at depths up to 120 feet below ground surface (bgs). Soil samples were analyzed for a comprehensive suite of analyses including VOCs, SVOCs, metals and pesticides.

In addition, during the implementation of Task 1 of the Consent Decree, approximately 298 groundwater samples of which 34 were duplicates were collected during roughly 32 sampling events from 1996 to 2006. Groundwater samples were analyzed for a comprehensive suite of analytes including VOCs, SVOCs, and metals.

Only data from groundwater samples collected from October 2004 to September 2006 are used in the qualitative risk analysis. Although groundwater samples were collected as early as 1996, these earlier samples cannot be assumed to be representative of current conditions.

Soil gas samples were collected from a total of 97 locations at depths up to 71 feet bgs. Seven sampling events occurred from 2004 to 2006, and a total of 271 samples (of which 31 were duplicates) were collected. Soil gas samples were collected in Summa canisters and analyzed by an off-site laboratory for VOCs using EPA Method TO-15. Soil gas data were used for qualitative analysis of risk analysis for the site and most surrounding parcels. However, these data were used quantitatively to evaluate vapor intrusion on the south parcel where the former Skateland facility was located.

Sixty-eight indoor air samples (of which 11 are duplicates) were collected from 25 locations during seven sampling events from 2004 to 2006. Thirteen ambient air samples (including one duplicate) were collected from nine locations during four of these sampling events. Air samples were collected in Summa canisters and analyzed by an off-site laboratory for VOCs using EPA Method TO-15, TO-15 SIM, or TO-14.

In conjunction with the soil vapor survey, soil conductivity profiling was performed during the RI using the Membrane Interface Probe (MIP) system. Evaluation of the soil conductivity and lithologic logs indicated the presence of a continuous clay unit underlying the Site and adjacent areas at an approximate depth of 30 feet bgs. This unit, identified in the RI report as the "30-foot clay unit" acts as an impediment to the upward migration of soil vapors emanating from vadose zone soils below the 30-foot clay unit, including off-gassing from groundwater. This unit is described at length in the RI report.

The protocol used and data generated from all of the sampling efforts are discussed in detail in the RI Report.

## 2.2 Data Evaluation

Chemical data were reviewed to determine overall usability, for assessing potential human health risks. Data were evaluated to assess precision, accuracy, representativeness, completeness, comparability (PARCC parameters) and sensitivity (blanks). Analytical results for data and details of the data quality assessment are presented in the RI Report. This assessment also includes a review of appropriateness of the reporting limits for risk assessment purposes. Data were found to be of high quality and are considered useable for risk assessment purposes.

Data representativeness is one of the most important criteria evaluated when selecting data for use in the quantitative HHRA. Representativeness is the extent to which available data characterize potential exposure conditions for human or ecological receptors. Proper selection of sampling locations, consideration of potential hot spots, assessment of background concentrations, and collection of a sufficient number of samples help maximize data representativeness. The RI data were collected

in contaminated or potentially contaminated areas and in areas where human contact is possible either currently or in the future.

Soil samples were collected throughout the Omega parcel and from variable depths, providing extensive documentation of the nature and extent of contamination at the site. Sampling was somewhat biased toward areas of known or suspected releases, so that the database as a whole is likely to be somewhat biased toward higher levels of contamination; Any such bias should result in overestimation of potential risks.

Indoor air samples were collected in one to several rounds, depending on the parcel as defined in Section 1. Multiple rounds of indoor air sampling help to minimize impact of any seasonal impacts. Moreover, several indoor air samples were collected in each building, from different areas. Multiple samples within a building help to minimize impacts of ventilation on VOC concentrations and help determine if and where building sources (e.g. consumer products) may impact results. Indoor air samples can be characterized as reasonably representative of indoor air quality in buildings on and around the site. Indoor air data may also reflect building sources rather than or in addition to vapors intruding from the subsurface. Thus, indoor air data may be biased by building sources unrelated to VOCs previously released at the Omega site.

## **2.3 Identification of Chemicals of Potential Concern**

General methods for selection of COPCs followed basic USEPA and CalEPA policy of initially including chemicals observed at the site, regardless of potential for human health risk, and putting any risks due to exposure to chemicals at the site in perspective during the risk characterization. In keeping with this policy, all chemicals detected in media at the site were retained as COPCs, with the following few exceptions:

- Inorganic soil constituents that are essential minerals and/or are present only at concentrations consistent with local ambient conditions were eliminated.
- Chemicals detected with a frequency of less than 5 percent, provided that other criteria as described below were met, were eliminated.
- Chemicals without available toxicity criteria were not retained as COPCs.
- Chemicals with maximum concentrations below regulatory health based screening levels were not retained as COPCs.

### **2.3.1 Non-Toxic and Essential Minerals**

Several metals that are generally recognized as non-toxic and are essential minerals will not be addressed in the risk assessment. Eliminated chemicals include calcium, sodium, potassium, magnesium, chloride, fluoride, nitrate, and nitrite. Some essential minerals, such as iron and manganese, were not eliminated in this step. Such metals,

though essential, can be associated with adverse effects and were retained unless eliminated in subsequent COPC selection steps.

### **2.3.2 Analysis of Ambient Concentrations of Arsenic**

Local ambient concentrations of arsenic in soil were assessed using guidance developed by the Department of Toxic Substances Control (DTSC) for selection of inorganic constituents as chemicals of concern (DTSC 1997). For this analysis, soil data for the site are combined into a single data set and plotted on a normal probability plot. Typically, both untransformed and lognormally transformed data are plotted, because the distribution of environmental data often approximates lognormal. These plots and summary data statistics are then evaluated. Where one of the normal probability plots approximates a straight line, the total data range is about an order of magnitude or less, and the coefficient of variation is less than one (i.e., data variability is low), the data are likely to be part of a single, local ambient distribution. Where normal probability plots are clearly non-linear and show one or more "inflection points", more than one population is likely to be present, and only those data that fulfill the above criteria can be considered to represent local ambient conditions. Typically, when inflection points are identified in the plots, data range is greater than an order magnitude, and the coefficient of variation is greater than one and often much higher.

The probability plot of the arsenic soil data from the Omega site is a straight line suggesting a single population of arsenic concentrations. These data likely represent local ambient conditions, not arsenic releases from the site. This conclusion is bolstered by the relatively small data range (0.8 to 21 mg/kg), and the small coefficient of variation (about 0.65). Moreover, the single higher value of 21 mg/kg is an obvious statistical outlier. The next highest arsenic concentration is less than 10 mg/kg along with the remaining 39 soil sample results in the data base. Finally, the distribution of sample locations (as presented in the RI) indicates substantial coverage of the Omega site (41 samples distributed over less than one acre) suggesting that the single higher value does not represent a substantial hotspot. This observation is consistent with the location of the single higher value at the northeast corner of the site parcel. Operations are not known to have been carried out in this location.

Evaluation of arsenic soil data for the site indicates that arsenic is present at local ambient levels at the site. The single higher value in the data set is a statistical outlier and most likely is a data artifact. Data are sufficiently robust to eliminate the possibility that this single value represents a significant hotspot at the site. On this basis, arsenic was eliminated as a COPC at the site. Results of the statistical analysis are provided in Appendix B.

### **2.3.2 Frequency of Detection**

Chemicals that are detected very infrequently at a site are not likely, with few exceptions, to contribute significantly to overall risk. Many chemicals reported in samples collected from soils at the site were in fewer than 5 percent of samples. These

chemicals may not represent a significant release at the site, and may not, in some cases, be site-related. Thus, elimination of these chemicals makes the risk assessment much less cumbersome and much more focused on significant releases at the site. However, prior to eliminating infrequently detected chemicals, several criteria must be met as described below.

Infrequently detected chemicals were not eliminated if they were: 1) known human carcinogens; 2) were detected at very high concentrations compared to minimum levels that could be associated with adverse effects (e.g. OEHHA soil California Human Health Screening Levels [CHHSLs], 2005b); and/or 3) were found at the site in localized "hotspots." Hotspots are defined as relatively small areas with chemical concentrations that are significantly higher than those in surrounding areas. In most, but not all, cases, hotspots correlate with source areas.

Chemicals that were infrequently detected and do not fall into any of the above categories were eliminated from the quantitative assessment. Chemicals eliminated include:

- 1,2-Dichlorobenzene, 1,4-dichlorobenzene, acetone, benzo(g,h,i)perylene, bromoform, cis-1,2-dichloroethene, diethylphthalate, di-n-butylphthalate, di-n-octylphthalate, endrin, trans-1,3-dichloropropene, trans-1,2-dichloroethene, total xylenes, and vinyl acetate in soil, 0 to 30 feet bgs
- 1,2,3-trichloropropane; 1,2,4-trichlorobenzene; 4-chlorotoluene; carbon disulfide; fluorene; isophorone; pentachlorophenol (PCP); phenanthrene; and methyl acetate in groundwater

### 2.3.3 Health Based Screening Criteria

Chemicals that were detected below regulatory health based screening levels are less likely to contribute significantly to overall risk than those chemicals detected above screening levels. Previous risk analyses conducted on the site data identified key constituents that drive the overall risk. Thus, elimination of chemicals detected at concentrations below screening levels makes the risk assessment much less cumbersome and much more focused on those chemicals that contribute significantly to overall risk. Maximum detected concentrations were used for the comparison and chemicals were eliminated if they fell below the screening level. Chemicals without screening levels were retained as COPCs. Screening criteria used were:

- **Soil** – USEPA Region 9 Preliminary Remediation Goals (PRGs) for industrial soil (USEPA 2004). To account for potential additivity of exposure to multiple chemicals, one-tenth of the PRG values were used for screening.
- **Groundwater** - EPA Target Groundwater Concentration Corresponding to Target Indoor Air Concentration Where the Soil Gas to Indoor Air Attenuation Factor = 0.001 and Partitioning Across the Water Table Obeys Henry's Law (EPA 2002). This source was selected because the only groundwater pathway of concern at the

site is for migration to indoor air. To account for potential additivity of exposure to multiple chemicals, one-tenth of the target values were used for screening. Screening of groundwater data was conducted to determine if any potential existed for vapor intrusion of VOCs in groundwater. The screening allowed qualitative indication of whether further evaluation of indoor air quality was warranted.

- **Soil gas** - CalEPA's California Human Health Screening Levels (CHHSLs) for Shallow Soil Gas (Vapor Intrusion) for Commercial/Industrial Use (EPA 2005). CHHSLs have only been developed for a small list of chemicals, so comparisons were made directly to the screening levels without an adjustment for multiple chemicals. Screening of soil gas data was conducted to determine if any potential existed for vapor intrusion. The screening allowed qualitative indication of whether further evaluation of indoor air quality was warranted and to help define chemicals of potential concern for the site. VOCs detected above screening levels in soil gas were assumed to be potential indoor air contaminants and were quantitatively evaluated if observed in indoor air above CHHSLs. The former Skateland parcel is an exception. Soil gas data for this parcel were used in quantitative estimates of potential exposure via vapor intrusion.
- **Indoor air** - CalEPA's CHHSLs for Indoor Air for Commercial/Industrial Use (EPA 2005). CHHSLs have only been developed for a small list of chemicals, so comparisons were made directly to the screening levels without an adjustment for multiple chemicals.

Based on this screening step, eliminated chemicals included:

- 1,2-dichlorobenzene; 1,4-dioxane; 4,4-DDD; 4,4-DDE; 4,4-DDT; aluminum; antimony; barium; benzo(a)anthracene; beryllium; butylbenzylphthalate; cadmium; chromium III; chrysene; cobalt; copper; diethylphthalate; di-n-butylphthalate; endrin; fluoranthene; manganese; mercury; molybdenum; nickel; total polychlorinated biphenyls (PCBs); pyrene; silver; thallium; vanadium; and zinc in surface soil, 0 to 1.5 feet bgs
- 1,1,2-Trichloroethane; 1,1-dichloroethane (1,1-DCA); 4,4-DDD; 4,4-DDE; 4,4-DDT; aluminum; antimony; barium; benzene; benzyl alcohol; beryllium; butylbenzylphthalate; cadmium; chloroform; chromium III; chrysene; cobalt; copper; fluoranthene; isophorone; manganese; mercury; molybdenum; nickel; total PCBs; pyrene; silver; thallium; trichlorofluoromethane; vanadium; and zinc in soil, 0 to 30 feet bgs
- Benzene, , m,p-xylenes, and toluene in soil gas for the Skateland parcel
- 1,1-DCA; 1,2-dichlorobenzene; 1,3-dichlorobenzene; 1,4-dichlorobenzene; 2-butanone; 2-methylnaphthalene; acetone; acetophenone; chlorobenzene; dichlorodifluoromethane; ethylbenzene; m,p-xylenes; MTBE; n-propylbenzene; o-xylene; sec-butylbenzene; and total xylenes in groundwater

- 1,1,1-Trichloroethane (1,1,1-TCA); m,p-xylenes; and o-xylenes in indoor air for the Site parcel
- 1,1,1-TCA; m,p-xylenes; o-xylenes; and toluene in indoor air for the north and west parcels
- 1,1,1-TCA; MTBE, m,p-xylenes; o-xylenes; toluene; and trichloroethene (TCE) in indoor air for the south-Bishop parcel
- M,p-xylenes; o-xylenes; and TCE in indoor air for the south-LA Carts/Oncology Care parcel

### 2.3.4 Selection of COPCs for Soil

Because some exposure pathways are limited to surface soil and others to subsurface soil, surface soil and subsurface soil were assessed separately. Surface soil includes samples up to 1.5 feet bgs. Subsurface soil was divided into two categories – 1.5 feet to 30 feet bgs and greater than 32 feet bgs. The 30-foot bgs limit was selected to represent the maximum depth to which construction workers could be exposed in an excavation if the site were to be redeveloped. Since several samples were collected below the 30-foot bgs limit, these samples were included in a separate group to check that no constituents were being overlooked.

Summary statistics for soil data are presented in Tables 2-1, 2-2, and 2-3. These tables show minimum and maximum concentrations, the range of reporting limits, and the detection frequency for all detected constituents in soil. In Table 2-2, subsurface soil from 1.5 to 30 feet bgs were combined with the surface soil data to create a soil data set that represents soil if the site were regraded, mixing surface soil with subsurface soil.

### 2.3.5 Selection of COPCs for Groundwater

Groundwater samples collected from October 2004 to September 2006 (the last two years) are considered to be more representative of current and future groundwater conditions than samples collected earlier. Summary statistics for groundwater data collected in 2004 through 2006 and presented in Table 2-4. This table shows minimum and maximum concentrations, the range of reporting limits, and the detection frequency for all detected constituents in groundwater. Similar statistics are also presented separately for data collected from 2001 to 2004 (Table 2-5). These statistics help show the variation in groundwater quality over time.

### 2.3.6 Selection of COPCs for Soil Gas

Soil gas samples were collected from depths of 2 feet bgs to 71 feet bgs in 1990, 1995, 1999, 2004, 2005, and 2006. Since the primary exposure pathway of concern is indoor air, only the more shallow gas samples, 0 to 6 feet bgs, were used in the primary analysis. Also, because soil gas concentrations are likely to change over time, only the more recent soil gas samples (2004 to 2006) are included in the analysis Table 2-6.

Measured indoor air data are used to evaluate all of the indoor air pathways for all of the parcels, except for the former Skateland facility because this building is soon to be demolished. Instead, measured soil gas data were used quantitatively to evaluate vapor intrusion on the south parcel where the former Skateland facility was located. Table 2-7 summarizes the soil gas data quantitatively evaluated for the former Skateland facility.

Because soil gas from deeper samples could in theory represent a source of VOCs at shallow depths, deeper soil gas samples, greater than 6 feet bgs, are presented in Table 2-8. These statistics help ensure that no detected constituent was overlooked in the shallower data. These deeper data were not used in the calculation of exposure point concentrations (Section 3.5).

### **2.3.7 Selection of COPCs for Indoor and Ambient Air**

Indoor and ambient air samples were collected from May 2004 to September 2006. Since indoor air data are evaluated separately by parcel, summaries of indoor air data by parcel are provided in Tables 2-9 through 2-13. Ambient air data are summarized in Table 2-14.

**Table 2-1  
Summary of Detected Chemicals in Surface Soil Samples (0 to 1.5 feet bgs)**

Chemical	Detections			Detection Frequency		Reporting Limits	
	Minimum mg/kg	Maximum mg/kg	Maximum Location	Number of Detections	Total Samples	Minimum mg/kg	Maximum mg/kg
1,2-DICHLOROBENZENE	0.083	0.24	OC-SS-000-20-040604	2	20	0.09	8
1,4-DIOXANE	0.014	14	OC-SS-000-20-040604	10	19	0.03	0.09
2-METHYLNAPHTHALENE	0.48	0.48	OC-SS-000-20-040604	1	22	0.09	8
4,4'-DDD	0.0016	0.032	OC-SS-000-15-040504	2	22	0.0005	0.05
4,4'-DDE	0.001	0.3	OC-SS-000-15-040504	6	22	0.0005	0.05
4,4'-DDT	0.003	0.15	OC-SS-000-16-040504	6	22	0.0005	0.05
ALUMINUM	9585	9830	OC1-000-12-S-0-7	2	2	NR	NR
ANTIMONY	0.6	0.9	OC-SS-000-17-040604, OC-SS-000-19-040604	8	22	6.7	10
ARSENIC	3	21	OCSS-000-01-040504	22	22	1	1
BARIUM	75	210	OC-SS-000-18-040604	22	22	1	1
BENZO(A)ANTHRACENE	0	0	OC-SS-000-09-040504	1	20	0.09	8
BERYLLIUM	0.18	0.52	OC-SS-000-20-040604	22	22	1	1
BIS(2-ETHYLHEXYL)PHTHALATE	0.03	51	OC-SS-000-20-040604	8	20	0.2	20
BUTYLBENZYL PHTHALATE	0.85	1.9	OCSS-000-01-040504	2	20	0.09	8
CADMIUM	0.25	2.1	OC1-000-04-S-0-5,OCSS-000-07-040504	22	22	1	1
CALCIUM	6055	7170	OC1-000-12-S-0-7	2	2	NR	NR
CHROMIUM	8.3	360	OC-SS-000-09-040504	22	22	1	1
CHRYSENE	0.038	0.038	OC-SS-000-09-040504	1	20	0.09	8
COBALT	6.3	12	OCSS-000-03-040504	22	22	5	5
COPPER	13	35	OCSS-000-06-040504	22	22	2	2
DIELDRIN	0.0084	0.05	OC-SS-000-15-040504	2	22	0.0005	0.05
DIETHYL PHTHALATE	0.037	0.037	OC-SS-000-14-040504	1	20	0.09	8
DI-N-BUTYLPHTHALATE	0.33	0.33	OC-SS-000-20-040604	1	20	0.09	8
ENDRIN	0	0	OC-SS-000-15-040504	1	22	0.0005	0.05
FLUORANTHENE (IDRYL)	0.033	0.033	OC-SS-000-09-040504	1	20	0.09	8
IRON	22100.0	23200	OC1-000-04-S-0-5	2	2	NR	NR
LEAD	5.0	100	OCSS-000-06-040504	22	22	5	5
MAGNESIUM	5190	5575	OC1-000-04-S-0-5	2	2	NR	NR
MANGANESE	239	353	OC1-000-12-S-0-7	2	2	NR	NR
MERCURY	0.029	0.85	OCSS-000-01-040504	20	22	0.11	0.2
MOLYBDENUM	3	3	OCSS-000-08-040504	1	20	5	5
NAPHTHALENE	1.2	1.2	OC-SS-000-20-040604	1	22	0.09	8
NICKEL	9.2	29.5	OC1-000-04-S-0-5	22	22	1	1
PCB-1254 (AROCLOR 1254)	0.5	0.5	OC-SS-000-16-040504	1	22	0.01	0.035
PHENANTHRENE	0.013	0.03	OC-SS-000-09-040504	2	20	0.09	8
POLYCHLORINATED BI PHENYLS, TOTAL	0.5	0.5	OC-SS-000-16-040504	1	20	0.01	0.02
POTASSIUM	4,350	4,520	OC1-000-12-S-0-7	2	2	NR	NR
PYRENE	0.018	0.044	OC-SS-000-09-040504	2	20	0.09	8
SILVER	0.56	1.2	OCSS-000-06-040504	3	22	1	1
SODIUM	290	320	OC1-000-04-S-0-5	2	2	NR	NR
THALLIUM	0.9	2	OCSS-000-02-040504 <sup>1</sup>	14	22	2.8	10
VANADIUM	20	52.5	OCSS-000-08-040504	22	22	1	1
ZINC	34	160	OCSS-000-07-040504	22	22	5	5

1 - Also includes samples OCSS-000-06-040504, OCSS-000-07-040504, OC-SS-000-13-040504, and OC-SS-000-17-040604

2 - Chromium concentrations were divided between Chromium III and Chromium VI assuming a 1:6 ratio of Cr VI:Cr III

mg/kg = milligram per kilogram

NR = not reported

**Table 2-2**  
**Summary of Detected Chemicals in Surface and Subsurface Soil Samples (0 to 30 feet bgs)**

Chemical	Detections			Detection Frequency		Reporting Limits	
	Minimum mg/kg	Maximum mg/kg	Maximum Location	Number of Detections	Total Samples	Minimum mg/kg	Maximum mg/kg
1,1,1-TRICHLOROETHANE	0.00097	1,200	SB-9-5.9-SOIL-12/13/1995	20	64	0.00083	30
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	0.0072	590	SB-9-5.9-SOIL-12/13/1995	10	64	0.005	100
1,1,2-TRICHLOROETHANE	0.0034	0.011	MIP3-B2-30	6	64	0.0008	50
1,1-DICHLOROETHANE	0.0036	0.013	MIP3-B2-30	6	64	0.0008	50
1,1-DICHLOROETHENE	0.0019	60	SB-9-1.8-SOIL-12/13/1995	16	64	0.0008	50
1,2-DICHLOROENZENE	0.00088	0.24	OC-SS-000-20-040604	3	84	0.00083	50
1,2-DICHLOROETHANE	0.0032	1.6	SUMP-0.5-SOIL-9/12/96	8	64	0.0008	50
1,4-DICHLOROBENZENE	0.0016	0.0016	MIP3-B2-05	1	84	0.0008	50
1,4-DIOXANE	0.014	41	MIP3-B2-15	18	35	0.025	2.5
2-METHYLNAPHTHALENE	0.48	0.54	SB-15-1.7-SOIL-12/11/1995	2	40	0.09	8
4,4'-DDD	0.0015	0.032	OC-SS-000-15-040504	3	40	0.0005	0.205
4,4'-DDE	0.001	0.3	OC-SS-000-15-040504	6	22	0.0005	0.205
4,4'-DDT	0.003	0.15	OC-SS-000-16-040504	6	22	0.0005	0.205
ACETONE	34	34	SUMP-5-SOIL-9/12/96	1	64	0.0081	1000
ALUMINUM	9,585	9,830	OC1-000-12-S-0-7	2	2	0	0
ANTIMONY	0.6	18	SB-13-1.8-SOIL-12/12/1995	10	40	6.7	10
ARSENIC	0.81	21	OCSS-000-01-040504	40	40	1	1
BARIUM	28	230	SB-13-1.8-SOIL-12/12/1995	40	40	1	1
BENZENE	0.0019	0.0019	MIP3-B2-30	1	64	0.00083	50
BENZO(A)ANTHRACENE	0.032	2.4	SB-15-1.7-SOIL-12/11/1995	2	38	0.09	8
BENZO(A)PYRENE	1.6	1.6	SB-15-1.7-SOIL-12/11/1995	1	38	0.09	8
BENZO(B)FLUORANTHENE	0.91	0.91	SB-15-1.7-SOIL-12/11/1995	1	38	0.09	8
BENZO(G,H,I)PERYLENE	0.49	0.49	SB-15-1.7-SOIL-12/11/1995	1	38	0.09	8
BENZYL ALCOHOL (PHENYLMETHANOL)	5.2	22	SB-9-5.9-SOIL-12/13/1995	2	38	0.09	8
BERYLLIUM	0.18	0.75	SB-12-1.7-SOIL-12/11/1995	40	40	1	1
BIS(2-ETHYLHEXYL)PHTHALATE	0.03	51	OC-SS-000-20-040604	13	38	0.2	20
BROMOFORM	0.013	0.013	MIP3-B2-15	1	64	0.004	50
BUTYLBENZYL PHTHALATE	0.85	1.9	OCSS-000-01-040504	2	38	0.09	8
CADMIUM	0.25	2.1	OC1-000-04-S-0-5, OCSS-000-07-040504	22	40	0.5	1
CALCIUM	6,055	7,170	OC1-000-12-S-0-7	2	2	0	0
CHLOROFORM	0.0014	0.013	MIP3-B2-30	10	64	0.0008	50
CHROMIUM	5.6	360	OC-SS-000-09-040504	40	40	1	1
CHROMIUM III <sup>(2)</sup>	4.8	309	OC-SS-000-09-040504	40	40	1	1
CHROMIUM VI <sup>(2)</sup>	0.8	51	OC-SS-000-09-040504	40	40	1	1
CHRYSENE	0.038	6	SB-15-1.7-SOIL-12/11/1995	2	38	0.09	8
CIS-1,2-DICHLOROETHENE	0.00096	0.0018	OC-SB-GP6-MIP-25-012204	2	64	0.00083	50
COBALT	4.7	16	SB-12-1.7-SOIL-12/11/1995	39	40	4	5
COPPER	13	150	SB-12-1.7-SOIL-12/11/1995	40	40	2	2
DIELDRIN	0.0084	0.05	OC-SS-000-15-040504	2	40	0.0005	0.205
DIETHYL PHTHALATE	0.037	0.037	OC-SS-000-14-040504	1	38	0.09	8
DI-N-BUTYLPHTHALATE	0.33	0.33	OC-SS-000-20-040604	1	38	0.09	8
DI-N-OCTYL PHTHALATE (DIOCTYL PHTHALATE)	0.24	0.24	SB-11-1.8-SOIL-12/14/1995	1	38	0.09	8
ENDRIN	0.032	0.032	OC-SS-000-15-040504	1	40	0.0005	0.305
FLUORANTHENE (IDRYL)	0.033	0.66	SB-15-1.7-SOIL-12/11/1995	2	38	0.09	8
IRON	22,100	23,200	OC1-000-04-S-0-5	2	2	0	0
ISOPHORONE	0.54	9.9	SB-9-1.8-SOIL-12/13/1995	3	40	0.09	8
LEAD	5	890	SB-12-1.7-SOIL-12/11/1995	39	40	5	5
MAGNESIUM	5,190	5,575	OC1-000-04-S-0-5	2	2	0	0
MANGANESE	239	353	OC1-000-12-S-0-7	2	2	0	0
MERCURY	0.029	0.85	OCSS-000-01-040504	21	40	0.1	0.2

**Table 2-2  
Summary of Detected Chemicals in Surface and Subsurface Soil Samples (0 to 30 feet bgs)**

Chemical	Detections			Detection Frequency		Reporting Limits	
	Minimum mg/kg	Maximum mg/kg	Maximum Location	Number of Detections	Total Samples	Minimum mg/kg	Maximum mg/kg
METHYLENE CHLORIDE	59	100	SB-9-5.9-SOIL-12/13/1995	2	64	0.005	50
MOLYBDENUM	1.5	4.2	SB-13-1.8-SOIL-12/12/1995	17	38	1	5
NAPHTHALENE	1.2	1.2	OC-SS-000-20-040604	1	56	0.004	8
NICKEL	4.9	55	SB-12-1.7-SOIL-12/11/1995	40	40	1	1
PCB-1254 (AROCOR 1254)	0.052	0.5	OC-SS-000-16-040504	3	40	0.01	0.06
PHENANTHRENE	0.013	5	SB-15-1.7-SOIL-12/11/1995	3	38	0.09	8
POLYCHLORINATED BI PHENYLS, TOTAL	0.5	0.5	OC-SS-000-16-040504	1	20	0.01	0.02
POTASSIUM	4,350	4,520	OC1-000-12-S-0-7	2	2	0	0
PYRENE	0.018	3.1	SB-15-1.7-SOIL-12/11/1995	3	38	0.09	8
SILVER	0.56	1.2	OCSS-000-06-040504	3	40	1	1
SODIUM	290	320	OC1-000-04-S-0-5	2	2	0	0
TETRACHLOROETHENE	0.0091	1,300	SB-9-1.8-SOIL-12/13/1995	63	64	0.001	0.1
THALLIUM	0.9	2	OCSS-000-02-040504 <sup>1</sup>	14	40	2.8	10
TOLUENE	62	62	SB-9-5.9-SOIL-12/13/1995	1	64	0.00083	50
TOTAL ORGANIC CARBON	670	6,000	C-2-15-SOIL-1/30/96	18	18	500	500
TOTAL XYLENES	0.1	0.1	C-3-30-SOIL-2/1/96	1	51	0.0032	200
TRANS-1,2-DICHLOROETHENE	0.0048	0.0103	MIP1-B3-29	2	64	0.0008	50
TRANS-1,3-DICHLOROPROPENE	0.024	0.024	C-3-15-SOIL-2/1/96	1	64	0.0016	50
TRICHLOROETHENE	0.0032	140	SB-9-5.9-SOIL-12/13/1995	21	64	0.001	50
TRICHLOROFLUOROMETHANE (FREON 11)	0.017	220	SB-9-5.9-SOIL-12/13/1995	6	64	0.004	50
VANADIUM	20	71	SB-5-1.8-SOIL-12/11/1995	40	40	1	1
VINYL ACETATE	0.05	0.05	C-3-15-SOIL-2/1/96	1	59	0.0083	500
ZINC	34	350	SB-12-1.7-SOIL-12/11/1995	40	40	5	5

1 - Also includes samples OCSS-000-06-040504, OCSS-000-07-040504, OC-SS-000-13-040504, and OC-SS-000-17-040604.

2 - Chromium concentrations were divided between Chromium III and Chromium VI assuming a 1:6 ratio of Cr VI:Cr III

mg/kg = milligram per kilogram

**Table 2-3  
Summary of Detected Chemicals in Subsurface Soil Samples (32+ feet bgs)**

Chemical	Detections			Detection Frequency		Reporting Limits	
	Minimum mg/kg	Maximum mg/kg	Maximum Location	Number of Detections	Total Samples	Minimum mg/kg	Maximum mg/kg
1,1,1,2-TETRACHLOROETHANE	0.0013	0.005	MIP3-B2-66	3	67	0.00078	0.25
1,1,1-TRICHLOROETHANE	0.0012	3.1	H-4-75-SOIL-1/30/96	39	91	0.00078	3
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	0.0059	0.98	B-4-75-SOIL-5/23/96	19	91	0.005	5
1,1,2-TRICHLOROETHANE	0.0015	0.14	OC-SB-GP4-MIP-068-012104	17	91	0.00078	3
1,1-DICHLOROETHANE	0.0011	0.03	OC-OU1-2	32	91	0.0007	3
1,1-DICHLOROETHENE	0.006	1.3	H-4-75-SOIL-1/30/96	42	91	0.00084	3
1,2-DIBROMO-3-CHLOROPROPANE	0.016	0.016	OC-OU1-3	1	71	0.0039	0.4
1,2-DICHLOROBENZENE	0.00093	0.0022	OC-OU1-2	2	91	0.00078	3
1,2-DICHLOROETHANE	0.0019	5	H-4-75-SOIL-1/30/96	34	91	0.00078	3
1,4-DIOXANE	0.018	1.5	OC-SB-GP5-MIP-073-012004	11	51	0.025	0.25
ACETONE	0.012	0.95	OC-S-OW1b-70-061699	3	91	0.006	50
BENZENE	0.0011	0.00755	MIP3-B2-57	17	91	0.00078	3
BROMOFORM	0.025	0.025	MIP3-B2-33	1	91	0.0012	3
CHLOROBENZENE	0.0015	0.0015	OC-OU1-2	1	91	0.00078	3
CHLOROFORM	0.0014	3	H-4-110-SOIL-1/30/96	46	91	0.0007	3
CIS-1,2-DICHLOROETHENE	0.0012	0.036	OC-OU1-1	12	91	0.00078	3
DI-ISOPROPYL ETHER (DIPE)	0.00099	0.00099	MIP8-B4-56	1	23	0.00078	0.21
METHYLENE CHLORIDE	0.0065	15	H-4-110-SOIL-1/30/96	15	91	0.005	3
Moisture/Tnfr	16	18	H-4-75-SOIL-1/30/96	2	2	0.00000	0
O-XYLENE	0.0016	0.0016	OC-OU1-5	1	71	0.00078	0.1
TETRACHLOROETHENE	0.002	56	B-4-55-SOIL-5/23/96	89	91	0.00094	1
TETRAHYDROFURAN	0.22	0.22	OC-S-OW1b-60-061699	1	1	0.05	0.05
TOLUENE	0.0013	14	H-4-75-SOIL-1/30/96	7	91	0.00078	3
TOTAL ORGANIC CARBON	510	2,700	GP1-070	35	39	500	500
TOTAL XYLENES	2	4	H-4-110-SOIL-1/30/96	2	37	0.0031	10
TRANS-1,2-DICHLOROETHENE	0.00091	0.06	MIP1-B3-69	18	91	0.00078	3
TRICHLOROETHENE	0.0022	4.2	H-4-75-SOIL-1/30/96	56	91	0.001	3
TRICHLOROFLUOROMETHANE (FREON 11)	0.0031	0.038	MIP-14-B1-34	18	91	0.0039	3

mg/kg = milligram per kilogram

**Table 2-4  
Summary of Detected Chemicals in Groundwater October 2004 to September 2006**

Chemical	Units	Detections			Detection Frequency		Reporting Limits	
		Minimum	Maximum	Maximum Location	Number of Detections	Total Samples	Minimum	Maximum
1,1,2,2-TETRACHLOROETHANE	ug/l	0.67	0.67	OW-GW-OW-1-082406	1	84	0.5	1,000
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	ug/l	0.14	2,500	OC-GW-OW8-022305	65	84	0.5	6,300
1,1,2-TRICHLOROETHANE	ug/l	1.3	2,000	OC2-OW1A-W-0-90	11	84	0.5	630
1,1'-BIPHENYL	ug/l	0.8	1.8	OC2-OW4B-W-0-80	2	25	5	5
1,1-DICHLOROETHANE	ug/l	0.31	140	OC-GW-OW8-022305	33	84	0.5	1,000
1,1-DICHLOROETHENE	ug/l	0.28	5,100	OC-GW-OW1-082405	66	84	0.5	1,000
1,2,3-TRICHLOROPROPANE	ng/L	10	65	OC2-OW8-W-0-91	2	83	5	630,000
1,2,4-TRICHLOROBENZENE	ug/l	0.53	5	OC2-MW8D-W-0-110	2	84	0.5	1,000
1,2,4-TRIMETHYLBENZENE	ug/l	3.7	52	OC-GW-OW8-022305	4	58	1	630
1,2-DIBROMO-3-CHLOROPROPANE	ug/l	5.5	5.5	OW-GW-OW-4A-082306	1	84	5	1,000
1,2-DICHLOROBENZENE	ug/l	3	39	OC-GW-OW8-022305	8	84	0.5	1,000
1,2-DICHLOROETHANE	ug/l	0.27	1,200	OC-GW-OW8-022305	33	84	0.5	1,000
1,3,5-TRIMETHYLBENZENE	ug/l	0.815	13	OC-GW-OW8-022305	4	58	1	630
1,3-DICHLOROBENZENE	ug/l	0.61	1.4	OC-GW-OW8-022305	4	84	0.5	1,000
1,4-DICHLOROBENZENE	ug/l	0.58	3.6	OC-GW-OW8-022305	5	84	0.5	1,000
1,4-DIOXANE	ug/l	0.47	13,000	OC2-OW1A-W-0-90	52	84	0.47	5,000
2-BUTANONE	ug/l	1.4	570	OC-GW-OW8-022305	4	30	5	13,000
2-CHLOROTOLUENE	ug/l	0.41	0.47	OW-GW-OW-1-082406	2	58	1	630
2-METHYLNAPHTHALENE	ug/l	0.3	7.9	OC2-OW4B-W-0-80	4	32	5	10
4-CHLOROTOLUENE	ug/l	0.46	0.46	OW-GW-OW-1-082406	1	58	1	630
ACETONE	ug/l	4.4	10,000	OC-GW-OW8-022305	19	84	5	13,000
ACETOPHENONE	ug/l	2.2	2.2	OC2-OW8-W-0-91	1	25	5	5
ANTIMONY	ug/l	1.6	1.9	OC2-OW2-W-0-89 <sup>(1)</sup>	25	34	10	60
ARSENIC	ug/l	0.45	17	OC2-OW8-W-0-91	25	34	0.005	0.005
BARIUM	ug/l	19	105	OC2-MW8D-W-0-110	33	33	10	10
BENZENE	ug/l	0.053	180	OC2-OW1A-W-0-90	28	84	0.5	630
BICARBONATE ALKALINITY (AS CaCO3)	mg/L	240	540	OW-1	33	33	1	2
BIS(2-ETHYLHEXYL)PHTHALATE	ug/l	0.62	4.6	OC2-MW7A-W-0-102	13	32	5	48
BOD 5 DAY (BIOCHEMICAL OXYGEN DEMAND)	mg/L	2	24	OC2-OW8-W-0-91	26	30	2	2
BORON	ug/l	290	310	OW-8	2	2	100	100
BROMIDE	mg/L	0.17	62	OC2-OW8-W-0-91	26	26	0.5	0.5
BROMODICHLOROMETHANE	ug/l	0.7	1	OC-GW-OW5-022405	3	84	0.5	1,000
BROMOFORM	ug/l	1.2	5.1	OC-GW-OW6-082405	4	84	0.5	1,300
BROMOMETHANE	ug/l	0.062	180	OC2-OW1A-W-0-90	7	84	0.5	1,300
CALCIUM	ug/l	62,300	285,000	OC2-OW8-W-0-91	26	26	100	100
CAPROLACTAM	ug/l	0.15	7.7	OC2-OW1B-W-0-83	2	25	5	5
CARBON DISULFIDE	ug/l	0.28	0.28	OC2-OW1B-W-0-83	1	28	0.5	1,000
CARBON TETRACHLORIDE	ug/l	0.094	0.6	OC-GW-OW1-022505	5	84	0.5	1,000
CHEMICAL OXYGEN DEMAND	mg/L	3.6	81	OC2-OW8-W-0-91	22	30	10	20
CHLORIDE	mg/L	40	370	OC2-OW8-W-0-91	31	31	5	10
CHLOROBENZENE	ug/l	1.6	7.6	OC-GW-OW8-022305	7	84	0.5	1,000
CHLORODIBROMOMETHANE	ug/l	0.54	16	OC-GW-OW5-082305	7	56	1	200
CHLOROFORM	ug/l	0.054	2,750	OC-GW-OW8-022305	63	84	0.5	630
CHLOROMETHANE	ug/l	0.63	8.7	OC2-MW8D-W-0-110	5	84	0.5	1,300
CHROMIUM	ug/l	0.28	146	OC2-MW8A-W-0-107	32	34	5	10
CHROMIUM VI	ug/l	1.9	160	OC2-MW8A-W-0-107	21	26	1	1
CIS-1,2-DICHLOROETHENE	ug/l	0.19	51	OC2-MW1A-W-0-98	37	84	0.5	1,000
COBALT	ug/l	0.15	5	OC2-OW4A-W-0-81	25	34	10	20
COPPER	ug/l	0.32	79	EW4-091406	25	34	2	10
CYANIDE	ug/l	1.9	5.4	OC2-MW1A-W-0-98	6	25	10	10
CYCLOHEXANE	ug/l	0.32	2.1	OC2-OW4B-W-0-80	3	26	0.5	1,000

**Table 2-4**  
**Summary of Detected Chemicals in Groundwater October 2004 to September 2006**

Chemical	Units	Detections			Detection Frequency		Reporting Limits	
		Minimum	Maximum	Maximum Location	Number of Detections	Total Samples	Minimum	Maximum
DICHLORODIFLUOROMETHANE	ug/l	0.19	1.35	OC-GW-OW8a-082405	11	84	0.5	1,300
DIMETHYL PHTHALATE	ug/l	0.68	0.68	OC2-OW8-W-0-91	1	32	5	10
ETHYLBENZENE	ug/l	0.051	41	OC-GW-OW8-022305	12	84	0.5	1,000
FLUORENE (ALPHA-DIPHENYLENEMETHANE)	ug/l	0.31	0.31	OC2-OW4B-W-0-80	1	32	5	10
FLUORIDE	mg/L	0.17	0.55	OC2-OW4B-W-0-80	25	25	NR	NR
HARDNESS (AS CaCO3)	mg/L	560	840	OW-8	8	8	1	4
IRON	ug/l	42	2,620	OC2-OW8-W-0-91	13	33	40	100
ISOPHORONE	ug/l	2.2	2.2	OC2-OW8-W-0-91	1	32	5	10
ISOPROPYL ALCOHOL (ISOPROPNOL)	ug/l	140	140	OC-GW-OW1B-022505	1	1	50	50
ISOPROPYLBENZENE	ug/l	0.095	6.7	OC-GW-OW8-022305	11	84	0.5	1,000
LEAD	ug/l	0.02	75	EW4-091406	18	34	1	5
M,P-XYLENES	ug/l	0.63	130	OC-GW-OW8-022305	6	58	1	630
MAGNESIUM	ug/l	38,200	95,200	OC2-OW8-W-0-91	26	26	20	20
MANGANESE	ug/l	0.31	4,010	OC2-OW8-W-0-91	29	33	10	20
MBAS (DETERGENTS) (SURFACTANTS)	mg/L	0.36	0.36	OC-GW-OW8a-082405	1	1	0.1	0.1
MERCURY	ug/l	0.03	0.22	OW-8	9	33	0.2	0.2
METHYL ACETATE	ug/l	1,300	1,300	OC2-OW8-W-0-91	1	26	0.5	1,000
METHYL CYCLOHEXANE	ug/l	0.47	2.4	OC2-OW4B-W-0-80	3	26	0.5	1,000
METHYL TERT-BUTYL ETHER	ug/l	0.18	5.7	OC2-MW5A-W-0-97	20	84	0.5	1,000
METHYLENE CHLORIDE	ug/l	0.25	9,150	OC-GW-OW8-022305	22	84	0.5	13,000
MOLYBDENUM	mg/L	0.073	0.073	OC-GW-OW3B-031306	1	9	20	20
NAPHTHALENE	ug/l	0.21	20	EW2-091306	13	83	1	200
NICKEL	ug/l	0.9	50.5	OC2-OW5-W-0-86	25	34	10	20
NITRATE (AS N)	mg/L	1.3	21	OC2-MW5A-W-0-97	27	27	0.15	0.30
NITRITE (AS N)	mg/L	0.24	0.5	OC2-OW8-W-0-91	4	25	0.1	0.25
N-NITROSODIMETHYLAMINE	ng/L	3.1	680	OC2-OW8-W-0-91	6	37	1.9	10,000
N-PROPYLBENZENE	ug/l	0.35	5.7	OC-GW-OW8-022305	6	56	1	200
O-XYLENE	ug/l	0.25	76.5	OC-GW-OW8-022305	9	58	1	630
PENTACHLOROPHENOL (PCP)	ug/l	0.3	0.3	OC2-OW8-W-0-91	1	32	5	20
PERCHLORATE	ug/l	1.3	7.6	OC2-MW7A-W-0-102	24	25	1	1
PH	SU	6.57	6.8	OW-1	3	3	1	1
PHENANTHRENE	ug/l	0.069	0.069	OC2-OW8-W-0-91	1	32	5	10
PHENOL	ug/l	8.5	11	OW-8	2	32	5	10
P-ISOPROPYLTOLUENE	ug/l	0.29	0.86	OC-GW-OW8-022305	4	58	1	630
POTASSIUM	ug/l	2300	8140	OC2-MW10A-W-0-104	8	26	500	500
SEC-BUTYLBENZENE	ug/l	0.29	0.39	OC-GW-OW8-022305	4	58	1	630
SELENIUM	ug/l	1	19	8D-W-0-110, OC2-MW7A-	26	33	5	10
SODIUM	ug/l	61,500	176,001	OC2-MW7A-W-0-102	26	26	500	500
SPECIFIC CONDUCTANCE (UMHO/CM X 10 <sup>-6</sup> )	umhos/cm	1,800	1,800	OC-GW-OW8a-082405	1	1	1	1
SULFATE	mg/L	150	660	OC2-OW6-W-0-82	28	28	2.5	10
TETRACHLOROETHENE	ug/l	0.21	170,000	OC-GW-OW1-022505	84	84	1	5,000
TETRAHYDROFURAN	ug/l	540	650	OC-GW-OW8-022305	2	2	50	50
THALLIUM	mg/L	0.028	0.028	OC-GW-OW8a-082405	1	34	1	10
TOLUENE	ug/l	0.073	1,300	OC-GW-OW8-022305	14	84	0.5	630
TOTAL ALKALINITY (AS CaCO3)	mg/L	240	540	OW-1	32	32	1	2
TOTAL DISSOLVED SOLIDS	mg/L	660	1,500	OC2-MW7A-W-0-102 <sup>(2)</sup>	34	34	10	50
TOTAL KJELDAHL NITROGEN (ORGANIC NITRO)	mg/L	0.16	1	OC2-OW8-W-0-91	10	25	0.15	0.15
TOTAL ORGANIC CARBON	mg/L	4.7	74	OC2-OW1A-W-0-90	27	31	1	1
TOTAL PHOSPHORUS	mg/L	0.32	0.32	OC2-OW1B-W-0-83	1	25	0.15	0.15
TOTAL XYLENES	ug/l	0.055	4.6	OC2-OW4B-W-0-80	4	26	0.5	1,000
TRANS-1,2-DICHLOROETHENE	ug/l	0.32	98	OC2-OW8-W-0-91	28	84	0.5	1,000

**Table 2-4  
Summary of Detected Chemicals in Groundwater October 2004 to September 2006**

Chemical	Units	Detections			Detection Frequency		Reporting Limits	
		Minimum	Maximum	Maximum Location	Number of Detections	Total Samples	Minimum	Maximum
TRICHLOROETHENE	ug/l	0.16	10,000	OC-GW-OW1-082405	73	84	0.5	1,000
TRICHLOROFLUOROMETHANE (FREON 11)	ug/l	0.18	1,000	OC-GW-OW2-02206	63	84	0.5	1,300
VANADIUM	ug/l	0.35	10	OC-GW-OW3B-031306	26	34	10	10
VINYL CHLORIDE	ug/l	0.775	0.78	OC-GW-OW8-022305	2	84	0.5	1,000
ZINC	ug/l	0.45	570	EW4-091406	28	34	2	20

mg/l = milligram per liter  
ug/l = microgram per liter  
ng/l = nanogram per liter  
NR - Not reported

(1) Also includes OC2-OW6-W-0-82, OC2-MW4C-W-0-95, OC2-MW5A-W-0-97  
(2) Also includes OC2-OW6-W-0-82, OC2-OW8-W-0-91

**Table 2-5  
Summary of Detected Chemicals in Groundwater 2001 to September 2004**

Chemical	Units	Detections			Detection Frequency		Reporting Limits	
		Minimum	Maximum	Maximum Location	Number of Detections	Total Samples	Minimum	Maximum
1,1,1,2-TETRACHLOROETHANE	ug/l	1.7	32	OC-GW-OW1-021903	10	95	0.2	400
1,1,1-TRICHLOROETHANE	ug/l	0.055	10,250	OC-GW-OW1-082704	58	153	0.2	1,000
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	ug/l	0.35	2,800	OC2-OW8-W-0-29	118	153	0.5	2,000
1,1,2-TRICHLOROETHANE	ug/l	0.35	150	OC2-OW8-W-0-29	18	153	0.2	1,000
1,1-DICHLOROETHANE	ug/l	0.25	130	OW-GW-OW1-051601	47	153	0.2	1,000
1,1-DICHLOROETHENE	ug/l	0.23	2,700	OW-GW-OW1-051601	131	153	0.5	400
1,2,3-TRICHLOROPROPANE	ng/L	2.4	87	OC2-OW8-W-0-29	18	136	2	400,000
1,2,4-TRIMETHYLBENZENE	ug/l	0.8	11	OW8-112003	2	95	0.2	400
1,2-DICHLORO-1,1,2-TRIFLUOROETHANE	ug/l	50	88	OC-GW-OW8-082202	4	3	25	50
1,2-DICHLOROBENZENE	ug/l	1.2	15	OC-GW-OW1-021903	10	153	0.2	1,000
1,2-DICHLOROETHANE	ug/l	0.24	805	OC-GW-OW8-031103	50	153	0.2	1,000
1,2-DICHLOROPROPANE	ug/l	0.62	1.6	OC2-MW4A-W-0-25	2	153	0.2	1,000
1,3,5-TRIMETHYLBENZENE	ug/l	2.4	2.4	OW8-112003	1	95	0.2	400
1,3-DICHLOROBENZENE	ug/l	0.48	0.77	OC-GW-OW1-022404	4	153	0.2	1,000
1,4-DICHLOROBENZENE	ug/l	0.089	3	OC-GW-OW1-021903	7	153	0.2	1,000
1,4-DIOXANE	ug/l	0.5	52,280	OC-GW-OW1-021903	88	129	0.5	5,050
2,6-DINITROTOLUENE	ug/l	0.18	0.18	OC2-MW1A-W-0-45	1	66	5	10
2-BUTANONE	ug/l	0.83	770	OC2-OW8-W-0-29	5	63	2	10,000
2-CHLOROTOLUENE	ug/l	0.28	0.6	OC1-OW1-W-0-3	3	95	0.2	400
4-NITROPHENOL	ug/l	1.6	1.6	OC2-MW4A-W-0-58, OC2-MW4B-W-0-59	2	66	20	100
ACETONE	ug/l	3	11,000	OC2-OW8-W-0-29	35	153	2	10,000
ACETOPHENONE	ug/l	6.9	6.9	OC2-OW8-W-0-29	1	58	5	10
ALUMINUM	ug/l	47	87	OC2-MW9B-W-0-43	4	58	10	200
AMMONIA NITROGEN (AS N)	mg/L	0.23	0.29	OC2-OW1A-W-0-34	2	58	0.15	0.15
ANTIMONY	ug/l	0.18	0.37	OC2-MW4B-W-0-23	4	66	0.19	60
ARSENIC	ug/l	0.53	65	OC2-OW8-W-0-29	53	66	0.5	4
BARIUM	ug/l	10	136	OW-GW-OW1-051601	65	66	1	4
BENZENE	ug/l	0.051	88	OC2-OW1A-W-0-34	46	153	0.2	200
BENZO(B)FLUORANTHENE	ug/l	0.13	0.13	OC2-MW7A-W-0-73	1	66	5	10
BENZO(K)FLUORANTHENE	ug/l	0.55	0.55	OC2-MW4C-W-0-39	1	66	5	10
BICARBONATE ALKALINITY (AS CaCO3)	mg/L	200	570	OC2-OW1A-W-0-34	58	58	NR	NR
BIS(2-ETHYLHEXYL)PHTHALATE	ug/l	2.5	80	OC2-MW5A-W-0-41	32	66	5	50
BOD 5 DAY (BIOCHEMICAL OXYGEN DEMAND)	mg/L	2	77	OC2-OW8-W-0-29	25	58	2	2
BORON	ug/l	120	680	OC2-MW7A-W-0-20	17	17	NR	NR
BROMIDE	mg/L	0.14	70	OC2-OW8-W-0-29	58	58	NR	NR
BROMOFORM	ug/l	0.3	0.95	OC2-MW4C-W-0-39	3	153	0.2	1,000
BROMOMETHANE	ug/l	2.5	2.5	OC2-MW8D-W-0-72	1	153	0.2	1,000
CADMIUM	ug/l	0.075	2.7	OC-GW-OW1-081701	3	66	0.07	5
CALCIUM	ug/l	49,500	285,999	OC2-OW8-W-0-29	58	58	NR	NR
CAPROLACTAM	ug/l	2	28	OC2-OW1A-W-0-34	5	58	5	10
CARBON DISULFIDE	ug/l	0.02	240	OC2-OW1A-W-0-34	5	59	0.5	50
CARBON TETRACHLORIDE	ug/l	0.073	1.1	OC-GW-OW6-021502	21	153	0.2	1,000
CHEMICAL OXYGEN DEMAND	mg/L	3.8	301	OC2-OW8-W-0-29	35	58	5	10
CHLORIDE	mg/L	43	370	OC2-OW8-W-0-29	58	58	NR	NR
CHLOROETHANE	ug/l	0.75	500	OC2-OW1A-W-0-34	15	153	0.2	400
CHLOROETHANE	ug/l	0.2	0.2	OC1-OW1-W-0-23	1	153	0.2	1,000
CHLOROFORM	ug/l	0.046	2,000	OC-GW-OW8-031103	114	153	0.5	400
CHLOROMETHANE	ug/l	0.4	8.55	OC2-MW1A-W-0-45	17	153	0.2	1,000
CHROMIUM	ug/l	0.55	160	OC2-MW8A-W-0-12	58	66	0.35	4
CHROMIUM (VI)	ug/l	0.65	177	OC2-MW8A-W-0-12	56	65	NR	1
CHRYSENE	ug/l	0.69	0.69	OC2-MW4C-W-0-39	1	66	5	10

**Table 2-5  
Summary of Detected Chemicals in Groundwater 2001 to September 2004**

Chemical	Units	Detections			Detection Frequency		Reporting Limits	
		Minimum	Maximum	Maximum Location	Number of Detections	Total Samples	Minimum	Maximum
CIS-1,2-DICHLOROETHENE	ug/l	0.14	97	OC-GW-OW5-022103	68	153	0.2	1,000
COBALT	ug/l	0.08	8.2	OW-GW-OW1-051601	32	66	0.12	50
COPPER	ug/l	0.44	11.3	OC-GW-OW1-021402	37	66	0.5	25
CYANIDE	ug/l	3.4	3.4	OC2-OW1A-W-0-34	1	65	5	25
CYCLOHEXANE	ug/l	1	16	OC2-MW5A-W-0-66	2	59	0.5	1,000
DICHLORODIFLUOROMETHANE	ug/l	0.19	7.7	OW8-112003	14	153	0.5	2,000
DI-N-BUTYLPHTHALATE	ug/l	0.54	1	OC2-MW5A-W-0-9, OC2-MW4A-W-0-5	4	66	5	20
DISSOLVED ORGANIC CARBON	mg/L	1.1	52	OC-GW-OW1-021903	7	7	1	5
ETHANE	ng/L	41.5	3,200	OC-GW-OW1-021903	3	3	5	5
ETHENE	ng/L	1,200	1,500	OC-GW-OW1B-021903	3	3	5	5
ETHYLBENZENE	ug/l	0.085	15	OC2-OW8-W-0-29	10	153	0.2	1,000
FLUORIDE	mg/L	0.14	0.6	OC2-MW4B-W-0-23	58	58	NR	NR
IRON	ug/l	33	3,350	OC2-OW1B-W-0-33	17	58	50	100
ISOPHORONE	ug/l	4.9	4.9	OC2-OW8-W-0-29	1	66	5	10
ISOPROPYL ALCOHOL (ISOPROSPANOL)	ug/l	350	940	OW-GW-OW4B-051601	4	4	200	200
ISOPROPYLBENZENE	ug/l	1	2.4	OC1-OW1-W-0-3	7	153	0.2	1,000
LEAD	ug/l	0.07	2.9	OW-GW-OW1B-051601	23	66	0.07	10
M,P-XYLENES	ug/l	0.3	44	OW8-112003	7	95	0.2	400
MAGNESIUM	ug/l	36,500	99,999	OC2-OW8-W-0-29	58	58	NR	NR
MANGANESE	ug/l	0.48	2,490	OC2-OW8-W-0-29	23	58	1	15
MERCURY	ug/l	0.02	0.2	OC-GW-OW1b-021402	11	64	0.015	0.4
METHANE	ug/l	4.6	2,400	OC-GW-OW1B-021903	3	3	0.015	0.015
METHYL TERT-BUTYL ETHER	ug/l	0.12	270	OW-GW-OW6-051601	37	152	0.2	1,000
METHYLENE CHLORIDE	ug/l	0.089	8,600	OC2-OW8-W-0-29	36	153	0.2	2,000
MOLYBDENUM	ug/l	1.4	136	OC-GW-OW1b-111601	24	25	0.5	6
NAPHTHALENE	ug/l	0.43	0.6	OC1-OW1-W-0-3	3	153	0.2	400
NICKEL	ug/l	1.2	75	OW-GW-OW1-051601	53	66	1	40
NITRATE (AS N)	mg/L	0.17	20	OC2-MW5A-W-0-66 (1)	64	65	0.11	0.55
NITRATE-NITRITE AS NITROGEN	mg/L	3.7	11	OC-GW-OW4A-022003(2)	6	7	0.15	0.75
NITRITE (AS N)	mg/L	0.06	1	OC-GW-OW1B-021903	5	65	0.05	0.75
N-NITROSODIMETHYLAMINE	ng/L	2.5	900	OC2-OW8-W-0-29, OC1-OW1-W-0-3	17	58	2	21
N-PROPYLBENZENE	ug/l	0.42	0.7	OC1-OW1-W-0-23	4	95	0.2	400
O-XYLENE	ug/l	0.55	27	OC-GW-OW8-082404	9	95	0.2	400
PERCHLORATE	ug/l	1.2	10	OC2-MW7A-W-0-20	58	73	1	4
PHENOL	ug/l	20	20	OC2-OW8-W-0-29	1	66	5	10
P-ISOPROPYLTOLUENE	ug/l	0.32	0.7	OC1-OW1-W-0-3	4	95	0.2	400
POTASSIUM	ug/l	1,860	5,420	OC2-MW11A-W-0-77	37	58	2500	2,500
SEC-BUTYLBENZENE	ug/l	0.26	1.4	OC-GW-OW6-021502	2	95	0.2	400
SELENIUM	ug/l	1.1	227	OC2-OW8-W-0-29	53	66	1	35
SILICA (SAME AS SI AS SIO2)	ug/l	25,000	46,000	OC2-MW1A-W-0-1	17	17	NR	NR
SODIUM	ug/l	57,000	167,501	OC2-MW7A-W-0-73	58	58	NR	NR
SULFATE	mg/L	95	670	OC2-MW7A-W-0-20	58	58	NR	NR
TETRACHLOROETHENE	ug/l	0.97	210,000	OC1-OW1-W-0-23	149	153	0.5	2,500
THALLIUM	ug/l	0.08	9.65	OC2-MW1A-W-0-45	14	66	1	4
TOLUENE	ug/l	0.092	880	OC-GW-OW8-031103	28	153	0.2	400
TOTAL ALKALINITY (AS CaCO3)	mg/L	200	570	OC2-OW1A-W-0-34	58	58	NR	NR
TOTAL DISSOLVED SOLIDS	mg/L	630	1,700	OC2-MW7A-W-0-20	58	58	NR	NR
TOTAL INORGANIC CARBON	ug/l	1.1	1.1	OC1-OW1-W-0-23	1	1	NR	NR
TOTAL KJELDAHL NITROGEN (ORGANIC NITRO)	mg/L	0.16	0.46	OC2-OW1A-W-0-34	8	58	0.15	0.15
TOTAL ORGANIC CARBON	mg/L	1.1	70	OC2-OW8-W-0-29	44	58	1	1
TOTAL XYLENES	ug/l	75	75	OC2-OW8-W-0-29	1	58	0.5	1,000

**Table 2-5  
Summary of Detected Chemicals in Groundwater 2001 to September 2004**

Chemical	Units	Detections			Detection Frequency		Reporting Limits	
		Minimum	Maximum	Maximum Location	Number of Detections	Total Samples	Minimum	Maximum
TRANS-1,2-DICHLOROETHENE	ug/l	0.495	130	OC2-OW8-W-0-29	30	153	0.2	1,000
TRICHLOROETHENE	ug/l	0.31	3,600	OC-GW-OW1-022404	138	153	0.5	400
TRICHLOROFUOROMETHANE (FREON 11)	ug/l	0.15	995	OC-GW-OW8-022003	114	153	0.5	1,000
VANADIUM	ug/l	0.41	17.2	OC-GW-OW1-081701	33	66	1	10
VINYL CHLORIDE	ug/l	0.5	0.9	OC1-OW1-W-0-23	4	153	0.2	1,000
ZINC	ug/l	1	260	OC-GW-OW1b-021402	34	66	1.6	80

(1) Also includes OC-GW-OW2-021903 and OC-GW-OW1-021903

(2) Also includes OC-GW-OW2-021903, OC-GW-OW1-021903

NR - Not reported

mg/l = milligram per liter

ug/l = microgram per liter

ng/l = nanogram per liter

**Table 2-6  
Summary of Detected Chemicals in Soil Gas 0 to 6 feet bgs**

Chemical	Detections			Detection Frequency		Reporting Limits	
	Minimum ppbv	Maximum ppbv	Maximum Location	Number of Detections	Total Samples	Minimum ppbv	Maximum ppbv
1,1,1-TRICHLOROETHANE	6.4	280000	OC-SG-006-VP08-081905	23	46	1	7700
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	240	450000	OC-SG-06-01-041204	46	46	1	15000
1,1,2-TRICHLOROETHANE	260	260	OC-SG-006-VP02-082205	1	46	1	1900
1,1-DICHLOROETHANE	9	26000	OC-SG-006-VP05-081705	20	46	1	4100
1,1-DICHLOROETHENE	21	270000	OC-SG-06-03-041204	46	46	1	5600
1,2,4-TRIMETHYLBENZENE	2	94	OC-SSD-SH-3F-092205	10	46	1	1900
1,2-DICHLORO-1,1,2-TRIFLUOROETHANE	64	15000	OC-SG-06-03-041204	5	5	NR	NR
1,2-DICHLOROETHANE	23	2500	OC-SG-006-VP08-081905	5	46	1	1900
1,3,5-TRIMETHYLBENZENE	5.7	36	OC-SSD-SH-3F-092205	8	46	1	1900
2,2,4-TRIMETHYLPENTANE	3.1	12	UC-10	5	24	1.4	1600
2-BUTANONE	2.6	55	OC-SSD-SH-2I-092105	4	44	1	1600
4-ETHYLTOLUENE	1.8	28.75	OC-SSD-SH-4F-092205	10	44	1	1600
ACETALDEHYDE	54	54	OC-SG-006-VP19-121305	1	1	NR	NR
ACETONE	19	8900	OC-SG-006-VP08-081905	23	44	1	6400
BENZENE	2.6	650	OC-SG-006-VP05-081705	18	46	1	1900
CARBON DISULFIDE	3.6	8400	OC-SG-006-VP08-081905	11	44	1	1600
CARBON TETRACHLORIDE	37	37	OC-SG-006-VP11-081505	1	46	1	1900
CHLOROFORM	2.5	3000	OC-SG-006-VP04-082205, OC-SG-006-VP05-081705	22	46	1	1900
CIS-1,2-DICHLOROETHENE	2.5	9300	OC-SG-006-VP10-081505	16	46	1	1900
CYCLOHEXANE	4.7	150	OC-SSD-SH-4F-092205	4	32	1	1600
DICHLORODIFLUOROMETHANE	2.8	1900	OC1-SG14A-G-0-28	15	46	1	1600
ETHYLBENZENE	1.8	900	OC-SSD-SH-3I-092105	9	46	1	1900
HEPTANE	2.4	290	OC-SSD-SH-4F-092205	3	32	1	1600
HEXANE (N-HEXANE)	3	230	OC-SSD-SH-4F-092205	2	32	1	1600
M,P-XYLENES	3.2	3800	OC-SSD-SH-3I-092105	13	46	1.4	3800
O-XYLENE	2.5	1600	OC-SSD-SH-3I-092105	10	46	1	1900
TETRACHLOROETHENE	61	500000	OC-SG-006-VP08-081905	46	46	1	7700
TETRAHYDROFURAN	5.3	30	OC-SSD-SH-1I-092105	8	32	1	1600
TOLUENE	7.8	1700	OC-SSD-SH-3I-092105	20	46	1	1900
TRANS-1,2-DICHLOROETHENE	2.6	5300	OC-SG-006-VP04-082205	17	44	1	1600
TRICHLOROETHENE	36	88000	OC-SG-06-03-041204	46	46	1	5500
TRICHLOROFLUOROMETHANE (FREON 11)	98	180000	OC-SG-06-03-041204	46	46	1	11000
VINYL ACETATE	84	84	OC-SSD-SH-2I-092105	1	32	1	6400

NR - Not reported  
ppbv = parts per billion volume

**Table 2-7  
Summary of Detected Chemicals in Soil Gas 0 to 6 feet bgs for South Parcel - Skateland**

Chemical	Detections			Detection Frequency		Reporting Limits	
	Minimum ppbv	Maximum ppbv	Maximum Location	Number of Detections	Total Samples	Minimum ppbv	Maximum ppbv
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	240	330,000	OC1-SG14A-G-0-28	7	7	1.4	670
1,1-DICHLOROETHENE	21	210,000	OC1-SG14A-G-0-28	7	7	1.4	670
1,2,4-TRIMETHYLBENZENE	3	3	UC-4B	1	7	1.4	1,900
2,2,4-TRIMETHYLPENTANE	4.2	12	UC-10	3	6	1.4	670
2-BUTANONE	2.6	2.6	UC-4B	1	6	1.4	670
4-ETHYLTOLUENE	2.4	2.4	UC-4B	1	6	1.4	670
ACETONE	35	78	SG-15-6FT	4	6	5.8	2,700
BENZENE	2.6	5.1	SG-15-6FT	2	7	1.4	1,900
CARBON DISULFIDE	3.6	3.6	UC-4B	1	6	1.4	670
CHLOROFORM	2.5	2.5	UC-4B	1	7	1.4	1,900
DICHLORODIFLUOROMETHANE	2.8	1,900	OC1-SG14A-G-0-28	5	7	1.4	670
HEXANE (N-HEXANE)	3	3	UC-10	1	6	1.4	670
M,P-XYLENES	3.2	7	SG-15-6FT	3	7	1.4	3,800
TETRACHLOROETHENE	140	13,000	OC1-SG14A-G-0-28	7	7	1.4	670
TOLUENE	7.8	690	SG-14-6FT	4	7	1.4	1,900
TRICHLOROETHENE	36	7,800	OC1-SG14A-G-0-28	7	7	1.4	670
TRICHLOROFLUOROMETHANE (FREON 11)	98	94,000	OC1-SG14A-G-0-28	7	7	1.4	670

ppbv = parts per billion volume

**Table 2-8**  
**Summary of Detected Chemicals in Soil Gas 6+ feet bgs**

Chemical	Detections			Detection Frequency		Reporting Limits	
	Minimum ppbv	Maximum ppbv	Maximum Location	Number of Detections	Total Samples	Minimum ppbv	Maximum ppbv
1,1,1-TRICHLOROETHANE	36	450,000	OC-SG-018-VP08-081905	91	194	0.78	11,000
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	1.1	560,000	OC-SG-058-VP18-121505	189	194	1	29,000
1,1,2-TRICHLOROETHANE	60	240	OC-SG-024-VP02-082205, OC-SG-018-VP02-082205	8	194	0.78	4,100
1,1-DICHLOROETHANE	6	22,000	OC-SG-012-VP05-081705	101	194	0.78	4,100
1,1-DICHLOROETHENE	1.2	870,000	OC-SG-051-VP14-121505	184	194	0.7	15,000
1,2,4-TRIMETHYLBENZENE	1.7	6.8	OC-SG-018-VP19-121305	16	194	0.8	4,100
1,2-DICHLORO-1,1,2-TRIFLUOROETHANE	480	13,000	OC-SG-12-03-041204	10	10	NR	NR
1,2-DICHLOROETHANE	7.8	35,000	OC-SG-070-VP06-081605	34	194	0.78	4,100
1,3,5-TRIMETHYLBENZENE	2	26	OC-SG-060-VP11-081505	2	194	0.78	4,100
1,3-BUTADIENE	1.3	92.5	OC-SG-060-VP27-053106	24	110	1	2,500
1,4-DIOXANE	6.5	6.5	OC-SG-036-VP25-030606	1	110	4	9,900
2,2,4-TRIMETHYLPENTANE	1	3,100	OC-SG-050-VP15-121405	26	110	1	2,500
2-BUTANONE	1.5	140	OC-SG-040-VP19-121305	34	185	1	2,500
2-HEXANONE	660	660	OC-SG-040-VP04-082205	1	185	1.6	9,900
2-PROPANOL	5.3	15,000	OC-SG-029-VP13-121205	14	110	4	9,900
4-ETHYLTOLUENE	1.3	8.5	OC-SG-018-VP19-121305	12	185	0.78	2,500
4-METHYL-2-PENTANONE	1	3.8	OC-SG-025-VP25-030606	3	185	1	2,500
ACETALDEHYDE	59	250	OC-SG-040-VP19-121305	5	5	NR	NR
ACETONE	6.5	14,500	OC-SG-060-VP02-082205	111	186	1	9,900
BENZENE	0.9	2,500	OC-SG-040-VP05-081705	70	194	0.78	4,100
BROMODICHLOROMETHANE	1.4	3.6	OC-SG-008-VP30-060106	4	185	0.78	2,500
BROMOFORM	1.3	1.3	OC-SG-010-VP26-053106	1	185	0.78	2,500
CARBON DISULFIDE	1	14000	OC-SG-070-VP04-082205	80	185	0.78	2,500
CARBON TETRACHLORIDE	20	52	OC-SG-060-VP11-081505	5	194	0.78	4,100
CHLOROFORM	1.2	37000	OC-SG-058-VP14-121505	113	194	0.78	4,100
CHLOROMETHANE	0.78	0.87	OC-SG-040-VP10-081505	2	194	0.78	9,900
CIS-1,2-DICHLOROETHENE	13	9,500	OC-SG-018-VP10-081505	43	194	0.78	4,100
CYCLOHEXANE	1.2	5,100	OC-SG-050-VP15-121405	21	110	1	2,500
DIBROMOCHLOROMETHANE	1.1	2	OC-SG-010-VP26-053106	2	185	0.78	2,500
DICHLORODIFLUOROMETHANE	1.4	3,100	OC-SG-035-VP24-030606	33	194	0.78	4,100
ETHANOL	6.4	135	OC-SG-12-01-041204	17	110	4	9,900
ETHYLBENZENE	1.3	7	OC-SG-018-VP19-121305	16	194	0.78	4,100
HEPTANE	1.2	2,600	OC-SG-050-VP15-121405	27	110	1	2,500
HEXANE (N-HEXANE)	1.1	10000	OC-SG-050-VP15-121405	38	110	1	2,500
M,P-XYLENES	2.3	160	OC-SG-060-VP11-081505	36	194	1	8,100
METHYL TERT-BUTYL ETHER	5.3	12	OC-SG-036-VP25-030606	3	185	1	2,900
METHYLENE CHLORIDE	1.4	18,000	OC-SG-060-VP03-082205	49	194	0.8	4,100
O-XYLENE	1	800	OC-SG-018-VP08-081905	27	194	0.78	4,100
PENTANE	7300	91,000	OC-SG-050-VP15-121405	2	2	NR	NR
TETRACHLOROETHENE	1.6	900,000	OC-SG-058-VP14-121505	182	194	0.7	15,000
TETRAHYDROFURAN	1	1,300	SG-8-18FT	3	110	1	2,500
TOLUENE	1.3	4,000	OC1-SG8A-G-0-25	88	194	0.7	4,100
TRANS-1,2-DICHLOROETHENE	8.9	20,000	OC-SG-070-VP04-082205	74	185	0.78	2,500
TRICHLOROETHENE	6.5	110000	OC-SG-058-VP14-121505	173	194	0.78	6,300
TRICHLOROFLUOROMETHANE (FREON 11)	1	220000	OC1-SG11A-G-0-24	189	194	1	14,000
VINYL CHLORIDE	13	140	OC-SG-050-VP06-081605	5	194	0.78	4,100

NR - Not reported  
ppbv = parts per billion volume

**Table 2-9  
Summary of Detected Chemicals in Indoor Air - Site Parcel**

Chemical	Detections			Detection Frequency		Reporting Limits	
	Minimum ppbv	Maximum ppbv	Maximum Location	Number of Detections	Total Samples	Minimum ppbv	Maximum ppbv
1,1,1-TRICHLOROETHANE	0.038	0.06	OC-IA-FS-07-091405	3	8	0.027	4.6
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	0.21	3.9	OC-AA-FD-07-051104	7	8	0.027	4.6
1,1-DICHLOROETHENE	0.17	4.4	OC-AA-FD-07-051104	7	8	0.027	4.6
ACETONE	10	2500	OC-IA-FD-09-091405	8	8	0.013	4.6
BENZENE	0.81	3.5	OC-IA-FS-14-091405	6	8	2	4.6
CARBON TETRACHLORIDE	0.091	0.11	OC-IA-FS-07-091405	5	8	2	4.6
CHLOROFORM	0.039	0.05	OC-AA-FS-13-051104	2	8	0.027	4.6
DICHLORODIFLUOROMETHANE	0.28	0.62	OC-IA-FS-14-091405	6	8	0.027	4.6
ETHYLBENZENE	0.73	11	OC-AA-FS-09-051104	7	8	0.027	4.6
M,P-XYLENES	3.3	61	OC-AA-FS-09-051104	7	8	0.67	84
METHYLENE CHLORIDE	0.43	74	OC-IA-FS-14-091405	6	8	0.067	8.4
O-XYLENE	0.66	18	OC-AA-FS-09-051104	7	8	0.027	4.6
TETRACHLOROETHENE	0.15	5.1	OC-IA-FS-07-091405	7	8	0.027	4.6
TOLUENE	8.9	620	OC-AA-FS-09-051104	8	8	0.027	4.6
TRICHLOROETHENE	0.046	1.2	OC-IA-FS-07-091405	6	8	2	4.6
TRICHLOROFUOROMETHANE (FREON 11)	0.35	2.4	OC-AA-FD-07-051104	6	8	0.027	4.6

ppbv = parts per billion volume

**Table 2-10**  
**Summary of Detected Chemicals in Indoor Air - North Parcel**

Chemical	Detections			Detection Frequency		Reporting Limits	
	Minimum ppbv	Maximum ppbv	Maximum Location	Number of Detections	Total Samples	Minimum ppbv	Maximum ppbv
1,1,1-TRICHLOROETHANE	0.038	0.038	OC-AA-FS-10-051104	1	5	0.032	0.24
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	0.25	5.1	OC-AA-FS-10-051104	5	5	0.032	0.24
1,1-DICHLOROETHENE	0.74	2.6	OC-AA-FS-10-091405	4	5	0.016	0.12
1,4-DICHLOROBENZENE	0.034	0.15	OC-AA-FS-10-051104	2	5	0.032	0.24
ACETONE	9.1	1400	OC-AA-FS-10-051104	5	5	0.8	6
BENZENE	0.28	0.33	OC-AA-FS-10-091405, OC-AA-FS-11-051104	4	5	0.08	0.6
CARBON TETRACHLORIDE	0.1	0.13	OC-AA-FS-10-091405, OC-AA-FS-11-051104	4	5	0.032	0.24
CHLOROFORM	0.041	0.066	OC-AA-FS-11-091405	3	5	0.032	0.24
DICHLORODIFLUOROMETHANE	0.25	0.66	OC-AA-FS-10-051104	5	5	0.032	0.24
ETHYLBENZENE	0.17	0.19	OC-AA-FS-10-051104	4	5	0.032	0.24
M,P-XYLENES	0.49	0.62	OC-AA-FS-10-091405	4	5	0.064	0.48
METHYLENE CHLORIDE	0.48	1.4	OC-AA-FS-10-051104	3	5	0.32	2.4
O-XYLENE	0.2	0.23	OC-AA-FS-10-051104	4	5	0.032	0.24
TETRACHLOROETHENE	0.62	3.3	OC-AA-FS-10-091405	4	5	0.032	0.24
TOLUENE	0.73	2	OC-AA-FS-10-091405	5	5	0.032	0.24
TRICHLOROETHENE	0.42	2.5	OC-AA-FS-10-091405	4	5	0.032	0.24
TRICHLOROFLUOROMETHANE (FREON 11)	0.25	2.1	OC-AA-FS-10-091405	5	5	0.032	0.24

NR - Not reported  
ppbv = parts per billion volume

**Table 2-11**  
**Summary of Detected Chemicals in Indoor Air - West Parcel**

Chemical	Detections			Detection Frequency		Reporting Limits	
	Minimum ppbv	Maximum ppbv	Maximum Location	Number of Detections	Total Samples	Minimum ppbv	Maximum ppbv
1,1,1-TRICHLOROETHANE	0.082	0.088	OC-AA-FS-06-051104	2	4	0.032	0.037
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	0.83	3.4	OC-AA-FS-05-051104	4	4	0.032	0.037
1,1-DICHLOROETHENE	1.4	5.7	OC-AA-FS-05-051104	4	4	0.016	0.018
1,4-DICHLOROBENZENE	0.038	0.045	OC-IA-FD-05-091405	2	4	0.032	0.037
ACETONE	9.2	18	OC-AA-FS-06-051104	4	4	0.79	0.92
BENZENE	0.36	0.45	OC-AA-FS-06-051104	4	4	0.079	0.092
CARBON TETRACHLORIDE	0.087	0.11	OC-IA-FD-05-091405	4	4	0.032	0.037
CHLOROFORM	0.042	0.048	OC-AA-FS-05-051104	4	4	0.032	0.037
DICHLORODIFLUOROMETHANE	0.3	0.58	OC-AA-FS-05-051104	4	4	0.032	0.037
ETHYLBENZENE	0.21	0.36	OC-AA-FS-05-051104	4	4	0.032	0.037
M,P-XYLENES	0.75	1.2	OC-AA-FS-05-051104,OC-AA-FS-06-051104	4	4	0.063	0.073
METHYLENE CHLORIDE	0.35	0.43	OC-AA-FS-05-051104	4	4	0.32	0.37
O-XYLENE	0.22	0.47	OC-AA-FS-05-051104,OC-AA-FS-06-051104	4	4	0.032	0.037
TETRACHLOROETHENE	5.7	15	OC-AA-FS-05-051104	4	4	0.032	0.037
TOLUENE	1.7	2.6	OC-AA-FS-05-051104	4	4	0.032	0.037
TRICHLOROETHENE	0.3	0.8	OC-AA-FS-05-051104	4	4	0.032	0.037
TRICHLOROFLUOROMETHANE (FREON 11)	0.61	1.2	OC-AA-FS-05-051104,OC-AA-FS-06-051104	4	4	0.032	0.037

ppbv = parts per billion volume

**Table 2-12**  
**Summary of Detected Chemicals in Indoor Air - South Parcel - Bishop**

Chemical	Detections			Detection Frequency		Reporting Limits	
	Minimum ppbv	Maximum ppbv	Maximum Location	Number of Detections	Total Samples	Minimum ppbv	Maximum ppbv
1,1,1-TRICHLOROETHANE	0.036	0.036	OC-IA-BIS-STORE-090806	1	3	0.03	0.062
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	0.44	1.3	OC-IA-BIS-STORE-090806	3	3	0.03	0.062
1,1-DICHLOROETHENE	0.9	3.6	OC-IA-BIS-STORE-090806	3	3	0.015	0.031
1,4-DICHLOROBENZENE	0.036	0.053	OC-IA-BIS-AO-090806	2	3	0.03	0.062
ACETONE	12	17.35	OC-IA-BIS-AO-090806	3	3	0.74	1.6
BENZENE	0.355	0.39	OC-IA-BIS-STORE-090806	3	3	0.074	0.16
CARBON TETRACHLORIDE	0.081	0.091	OC-IA-BIS-AO-090806	3	3	0.03	0.062
CHLOROFORM	0.032	0.036	OC-IA-BIS-STORE-090806	2	3	0.03	0.062
DICHLORODIFLUOROMETHANE	0.55	0.605	OC-IA-BIS-AO-090806	3	3	0.03	0.062
ETHYLBENZENE	0.19	0.4	OC-IA-BIS-STORE-090806	3	3	0.03	0.062
M,P-XYLENES	0.615	1.1	OC-IA-BIS-STORE-090806	3	3	0.06	0.12
METHYL TERT-BUTYL ETHER	0.19	0.19	OC-IA-BIS-STORE-090806	1	3	0.15	0.31
METHYLENE CHLORIDE	0.29	0.49	OC-IA-BIS-STORE-090806	2	3	0.3	0.62
O-XYLENE	0.23	0.39	OC-IA-BIS-STORE-090806	3	3	0.03	0.062
TETRACHLOROETHENE	1	4.3	OC-IA-BIS-STORE-090806	3	3	0.03	0.062
TOLUENE	1.8	2.2	OC-IA-BIS-STORE-090806	3	3	0.03	0.062
TRICHLOROETHENE	0.083	0.28	OC-IA-BIS-STORE-090806	3	3	0.03	0.062
TRICHLOROFLUOROMETHANE (FREON 11)	0.39	0.65	OC-IA-BIS-STORE-090806	3	3	0.03	0.062

ppbv = parts per billion volume

**Table 2-13**  
**Summary of Detected Chemicals in Indoor Air - South Parcel - LA Carts/Oncology Care**

Chemical	Detections			Detection Frequency		Reporting Limits	
	Minimum ppbv	Maximum ppbv	Maximum Location	Number of Detections	Total Samples	Minimum ppbv	Maximum ppbv
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	0.092	1.9	OC-IA-LAC-Sm Prod-090806	5	5	0.027	0.16
1,1-DICHLOROETHENE	0.015	0.92	OC-IA-LAC-Sm Prod-090806	5	5	0.013	0.082
1,2-DICHLOROETHANE	0.08	0.08	OC-IA-ONC-NS-090806	1	5	0.027	0.16
1,4-DICHLOROBENZENE	0.028	0.065	OC-IA-ONC-NS-090806	2	5	0.027	0.16
ACETONE	31	490	OC-IA-LAC-Sm Prod-090806	5	5	0.67	4.1
BENZENE	0.36	0.68	OC-IA-LAC-Lg Prod-090806	5	5	0.067	0.41
CARBON TETRACHLORIDE	0.079	0.083	OC-IA-ONC-AO-090806	4	5	0.027	0.16
CHLOROFORM	0.029	0.14	OC-IA-ONC-AO-090806	4	5	0.027	0.16
DICHLORODIFLUOROMETHANE	0.52	0.68	OC-IA-ONC-NS-090806	5	5	0.027	0.16
ETHYLBENZENE	0.22	0.47	OC-IA-LAC-Lg Prod-090806	5	5	0.027	0.16
M,P-XYLENES	0.67	1.7	OC-IA-LAC-Lg Prod-090806	5	5	0.054	0.33
METHYLENE CHLORIDE	1.5	1.7	OC-IA-LAC-Lg Prod-090806	2	5	0.27	1.6
O-XYLENE	0.24	0.59	OC-IA-LAC-Lg Prod-090806	5	5	0.027	0.16
TETRACHLOROETHENE	0.036	0.24	OC-IA-LAC-Lg Prod-090806	3	5	0.027	0.16
TOLUENE	2.8	150	OC-IA-LAC-Sm Prod-090806	5	5	0.027	0.16
TRICHLOROETHENE	0.22	0.22	OC-IA-LAC-AO-090806	1	5	0.027	0.16
TRICHLOROFLUOROMETHANE (FREON 11)	0.26	0.57	OC-IA-LAC-Sm Prod-090806	5	5	0.027	0.16

ppbv = parts per billion volume

**Table 2-14**  
**Summary of Detected Chemicals in Ambient Air**

Chemical	Detections			Detection Frequency		Reporting Limits	
	Minimum ppbv	Maximum ppbv	Maximum Location	Number of Detections	Total Samples	Minimum ppbv	Maximum ppbv
1,1,1-TRICHLOROETHANE	0.21	0.21	OC-AA-FS-08-051104	1	12	0.029	0.18
1,1,2,2-TETRACHLOROETHANE	0.057	0.057	OC-AA-FS-03-051104	1	12	0.029	0.18
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	0.093	0.23	OC-AA-FS-08-051104	7	12	0.029	0.18
1,1-DICHLOROETHENE	0.033	0.16	OC-AA-FS-08-051104	6	12	0.015	0.092
1,2-DICHLOROBENZENE	0.049	0.049	OC-AA-FS-03-051104	1	12	0.029	0.18
1,4-DICHLOROBENZENE	0.065	0.065	OC-AA-FS-03-051104	1	12	0.029	0.18
ACETONE	6	1600	OC-AA-FS-15-051104	8	11	0.73	4.6
BENZENE	0.25	0.34	OC-AA-FS-04-051104	7	12	0.073	0.46
CARBON TETRACHLORIDE	0.078	0.1	OC-AA-FS-03-091405	7	12	0.029	0.18
DICHLORODIFLUOROMETHANE	0.37	0.67	OC-AA-FS-12-051104,OC-AA-FS-24-080404	8	12	0.029	0.18
ETHYLBENZENE	0.1	0.22	OC-AA-FS-04-051104	8	12	0.029	0.18
M,P-XYLENES	0.3	0.72	OC-AA-FS-04-051104	8	12	0.058	0.37
METHYLENE CHLORIDE	0.6	0.6	OC-AA-FS-12-051104	1	12	0.29	1.8
O-XYLENE	0.1	0.275	OC-AA-FS-04-051104	8	12	0.029	0.18
TETRACHLOROETHENE	0.08	0.26	OC-AA-FS-08-091405	7	12	0.029	0.18
TOLUENE	0.98	4.2	OC-AA-BIS-090806	9	12	0.029	0.18
TRICHLOROETHENE	0.042	0.2	OC-AA-FS-08-051104	5	12	0.029	0.18
TRICHLOROFLUOROMETHANE (FREON 11)	0.28	0.35	OC-AA-FS-08-091405	8	12	0.029	0.18

NR - Not reported  
ppbv = parts per billion volume

# Section 3

## Exposure Assessment

Populations that may be exposed to contaminants at a site and pathways by which these populations may come into contact with site contaminants are identified in the exposure assessment. In addition, methods used to quantify potential exposures are presented. The goal of the exposure assessment is to estimate reasonable maximum exposure (RME) and average or central tendency exposure (CTE) for populations that may be exposed to chemicals at the site. RME typically falls within the 90th to 99.9th percentile of possible exposures (EPA, 1993b), and is designed to fall among the highest exposures that are reasonably expected to occur. Estimates for RME typically form the basis for remedial decisions. CTE is based on typical human behavior patterns. Estimates of CTE are generally used to evaluate uncertainties and obtain insights into the range of exposures that may occur.

The remainder of this section discusses evaluation of RME and CTE for people that may use the site currently or in the future after redevelopment. This section is divided into several subsections, as follows:

- Exposure Assessment Process (Section 3.1)
- Site Setting (Section 3.2)
- Site Conceptual Exposure Model (SCEM) (Section 3.3)
- Exposure Parameter Assumptions (Section 3.4)
- Exposure Point Concentrations (Section 3.5)
- Chemical Intake Equations (Section 3.6)

### 3.1 Exposure Assessment Process

Exposure is defined as human contact with a chemical or physical agent (EPA, 1989). Exposure assessment is the estimation of magnitude, frequency, duration, and pathway(s) of exposure to a chemical. Assessment of exposure consists of three steps:

- Characterization of Exposure Setting
- Identification of Exposure Pathways
- Quantification of Exposure

The first step involves identifying physical characteristics of a site and the current and potential future use of the site by people. These characteristics, along with concentrations and distributions of COPCs, define the exposure setting for current and future human receptors.

Step two of the exposure assessment identifies pathways by which people might be exposed to site-related chemicals. Chemical sources, release and transport mechanisms, and inter-media transfer are evaluated. Exposure pathways are identified based on the location and activities of potentially exposed human receptors and on the types of potentially contaminated media.

The final step, exposure quantification, has two components: estimation of exposure point concentrations and calculation of chemical intake. Exposure point concentrations are chemical concentrations at the point of human contact with site media such as soil and soil gas. Site-specific chemical data from site investigations are used to estimate chemical exposure point concentrations. Summary statistics for available site data, exposure point concentrations, and equations for estimating these concentrations will be presented in the HHRA.

Chemical intake is the amount of chemical contacted per unit of body weight per unit of time, generally expressed as milligrams (mg) of chemical intake per kilogram (kg) body weight per day. Chemical intake is calculated by combining pathway-specific exposure assumptions, such as frequency and duration of exposure, with exposure point concentrations. Pathway-specific exposure assumptions are presented herein; chemical intake calculations are included in appendices to this document. Pathway-specific exposure assumptions used to calculate intake are based on site-specific data (when available) and USEPA and/or CalEPA default exposure assumptions.

## 3.2 Site Setting

Included in the characterization of the exposure setting is a description of physical characteristics of the site and identification of current and potential future human populations on and near the site as they pertain to potential human exposure.

As previously discussed, the Omega site is located in a commercial/industrial area in Whittier, California. From 1976 to 1991, Omega Chemical Corporation operated a treatment and disposal facility for commercial and industrial solid and liquid wastes and a transfer station for storage and consolidation of wastes for shipment to other treatment and/or disposal facilities. In 2003, Van Owen Holdings LLC of Los Angeles, California purchased the property. Currently, two buildings (an office building and a warehouse) are located at the relatively flat Site, with concrete paving covering exterior areas. Star City Auto Body occupies the warehouse (12504 Whittier Blvd.) and performs auto body repair and painting on the premises. The auto body shop also leases the small paved parking lot north of the warehouse building for automobile parking. The former administrative building (12512 Whittier Blvd.) and larger paved parking area south of the warehouse have had a variety of tenants since 2003. The former administration building is currently unoccupied, and the parking lot is used for temporary storage of wooden pallets by L&M Pallets on a month-to-month lease basis.

One commercial property (formerly Skateland) and two industrial properties (Medlin & Son and Terra Pave) are immediately adjacent to the Site (southeastern, northwestern, and southwestern boundaries, respectively). The northeastern boundary of the Site is bordered by Whittier Boulevard and a frontage road. Skateland, located at 12520 Whittier Boulevard, consists of an indoor roller skating rink building that is no longer in operation and that will soon be demolished. The Medlin & Son (former Cal-Air facility) facility, located at 12484 Whittier Boulevard, is operated as a machine shop (screw machines, lathes and mills, tapping and threading, saw cutting, welding, etc.).

The Terra Pave, Inc. facility, located at 12511 East Putnam Street, is utilized by a paving contractor. The property is utilized for temporary storage of asphalt paving materials for various job sites. Terra Pave also utilizes the property to park and maintain a variety of support vehicles and heavy-duty paving equipment. New England Lead Burning Company (NELCO), previously operated on the Terra Pave site in the mid-1950s. According to a Phase 1 Environmental Site Assessment (ESA) Report of the property prepared by Cardinal Environmental Consultants (Cardinal) on September 11, 1991, NELCO purchased lead in sheets, pipe and solid rods and fabricated the desired product by burning (welding) the lead to the required shape. NELCO subcontracted Vector Three Environmental Inc. of Brea, California, to clean the interior of all facilities and remove superficial lead from the topsoil. Remedial activities were monitored by Cardinal staff and confirmatory dust wipe and soil samples confirmed that remaining lead levels were very low. Environmental reports and sampling results were not available for review; therefore, lead levels prior to and after remediation and the depth of the soils removal are unknown.

Both current and future land use are evaluated in the selection of potential human receptors (EPA, 1991a). As described above, the site is currently used for industrial purposes and will likely remain industrial or commercial in the future given the site surroundings of commercial/industrial use. The site has never been used for residential purposes in the past, and its location next to a major arterial suggests that it would be undesirable for future residential development.

During an August 2006 groundwater sampling event, groundwater underlying the Site was measured at a depth of approximately 75 feet below ground surface. A clay unit exists starting at about 30 feet bgs, which likely represents a substantial barrier to upward migration of VOCs that volatilize at the capillary fringe of the water table. Currently, groundwater underlying the Site and in the immediate area is not used for domestic, industrial, or agricultural purposes. Future use of groundwater for potable purposes is also unlikely due to high concentrations of TDS. No evidence suggests that contamination extends to any potable aquifer that underlies the Gage unit.

### **3.3 Site Conceptual Exposure Model**

The site conceptual exposure model is a description of potential exposure pathways associated with the site, including potential sources of contamination, transport mechanisms, exposure routes, and potentially exposed populations. An exposure

scenario consists of a potentially exposed population and one or more exposure pathways by which the receptor population may contact contaminants associated with a site. Only exposure pathways likely to be complete and to contribute significantly to overall exposure are evaluated quantitatively in the HHRA.

A complete exposure pathway consists of the following four elements:

- A source and mechanism of release of chemicals to the environment
- A transport medium for the released chemical
- An exposure point (the point of potential contact between receptor and medium)
- An exposure route (e.g., inhalation, ingestion)

If one or more of these elements are missing, the pathway is incomplete. Incomplete pathways are not quantitatively evaluated. Potentially complete pathways that are unlikely to contribute significantly to overall exposure are also not quantitatively evaluated. Therefore, an analysis of exposure pathways is included to identify those complete and significant exposure pathways that may be important for risk management decisions.

Sources of contamination, mechanisms of contaminant release from sources, and subsequent transport of contaminants through the environment are examined in this section to identify potentially contaminated media at the site. Potential exposure pathways for human receptors are discussed in subsequent sections.

The site conceptual exposure model (SCEM) for the site, illustrated in Figure 3-1, highlights pathways that are assumed potentially complete and significant. Chemical migration from soil to groundwater and subsequent exposure of people to chemicals in groundwater is not addressed.

Complete exposure pathways shown in the SCEM (Figure 3-1) are summarized in Table 3-1.

### **3.3.1 Potentially Exposed Populations**

The overall scope of the analysis is graphically illustrated in the SCEM for soils at the Omega Site (Figure 3). The SCEM includes theoretically feasible exposures and provides a basis for discussing the likelihood and importance of potential exposure pathways at the site. As illustrated in the SCEM, potentially exposed populations are assumed to be an on-site industrial worker, an off-site industrial worker, and an on-site construction worker. Currently, no plans exist for residential development at the Site, and the Site location surrounded by commercial/industrial uses suggests that residential development in areas adjacent to the Site is unlikely.

### 3.3.1.1 Commercial/Industrial Workers

Potentially complete exposure pathways for commercial/industrial workers consist of incidental ingestion of surface soil following contact and subsequent hand-to-mouth activities<sup>1</sup>, incidental ingestion of dust tracked from surface into buildings, inhalation of contaminants released from soil into air through wind or dust-generating activities (e.g., use of vehicles), and inhalation of volatiles in soil gas migrating into indoor air. Commercial/industrial workers could also be exposed through dermal contact with soil and interior dust and inhalation of soil gas accumulating indoors. Dermal exposure pathways are not expected to contribute significantly to overall exposure; however, this pathway is quantitatively evaluated. Incidental ingestion of surface soil and indoor dust are also evaluated.

If the site were redeveloped in the future, some subsurface soils may be brought to the surface during grading activities. However, typical construction in the area is slab-on-grade resulting in minimal disturbance of deeper soils. Evaluation of deeper subsurface soils was not deemed necessary for commercial/industrial workers.

### 3.3.1.2 Construction Workers

Potentially complete exposure pathways for commercial/industrial workers consist of incidental ingestion of surface soil following contact and subsequent hand-to-mouth activities, inhalation of fugitive dust through wind or dust-generating activities (e.g., use of vehicles, drilling, digging), and inhalation of contaminants released from soil gas into an excavation. Workers could also be exposed through dermal contact with soil and fugitive dust. Dermal exposure pathways are not expected to contribute significantly to overall exposure, however, this pathway is quantitatively evaluated.

Construction workers are also evaluated for exposure to subsurface soil. Subsurface soil at the site was sampled to evaluate the depth to which soils may have been contaminated. Workers are evaluated for incidental ingestion of subsurface soil.

## 3.3.2 Potential Exposure Pathways

As discussed above, an exposure pathway generally consists of a chemical source, mechanism for release and transport, a point of exposure to the contaminated medium, and a route of exposure into the receptor. The absence of any one of these elements would result in an incomplete exposure pathway. Further, if one of these steps is very inefficient, exposure potential may be negligible, even though the pathway is theoretically complete. Potential exposure pathways are therefore identified in the SCEM and evaluated to determine whether they are complete and significant. The SCEM (Figure 3) identifies those complete pathways that may represent significant potential for exposure and are therefore the focus of the HHRA. As described above, receptors of concern include commercial/industrial workers, construction workers, and recreational users.

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<sup>1</sup> Under current conditions, much of the site is paved or otherwise covered by buildings or concrete. As such, this ingestion pathway is only applicable if the site is redeveloped in the future to remove buildings or pavement, thereby exposing commercial/industrial workers to bare soil.

### **3.3.2.1 Ingestion and Dermal Contact with Groundwater**

Currently, groundwater within the contaminant area (Gage unit) is not used for domestic, industrial, or agricultural purposes. Future use of groundwater for potable purposes is also unlikely due to high concentrations of TDS. No evidence suggests that contamination extends to any potable aquifer that underlies the Gage unit. If future data collection indicates that downward vertical migration has occurred, then future risk evaluations will need to address a potential drinking water pathway. Currently, this groundwater exposure pathway for ingestion is incomplete for all potential receptors.

Groundwater is 70 feet below ground surface and construction workers will not encounter groundwater in their excavations. Currently, this groundwater exposure pathway for dermal contact is also incomplete.

### **3.3.2.2 Incidental Ingestion and Dermal Contact with Contaminated Surface Soil and Inhalation of Particulates Released from Surface Soil**

Soils at the site contain elevated levels of some chemicals as a result of past practices and activities. Currently, surface soils at the site, for the most part, are not exposed because the site is mostly covered with asphalt pavement, buildings, or other structures. Direct contact with contaminants in surface soils is likely minimal. However, for the purposes of the HHRA, the site is assumed to be uncovered (unpaved) and direct exposure to COPCs in surface soil could occur.

If areas with contaminated surface soils are left uncovered following theoretical future redevelopment, future on-site commercial/industrial workers may contact surface soils. Potentially complete and significant pathways through which future on-site commercial/industrial workers may contact surface soils consist of incidental ingestion, dermal contact, and inhalation of particulates released from surface soils into ambient air.

Furthermore, if the pavement and buildings at the site are removed during construction, contaminated soils may be uncovered. Future on-site construction workers may incidentally ingest and dermally contact contaminants in surface soils and may inhale particulates released from surface soils. Although these exposures are unlikely to be significant given the duration of construction activities, they will be evaluated to provide the risk manager with additional information.

### **3.3.2.3 Incidental Ingestion of Subsurface Soils, Dermal Contact with Subsurface Soils, and Inhalation of Particulates Released from Subsurface Soils**

If the site is redeveloped in the future, future on-site construction workers may contact contaminated subsurface soils. Construction workers may incidentally ingest and dermally contact contaminants in subsurface soils and may inhale particulates released from subsurface soils into ambient air. Future construction workers are

expected to be the only human populations with potential exposure to subsurface soils.

#### **3.3.2.4 Inhalation of Contaminants in Indoor Air**

Contaminants released from contaminated soil into soil gas above the 30-foot clay may migrate below buildings and migrate indoors through foundation cracks. People working or recreating indoors in these buildings may inhale contaminants in indoor air. Because dilution of air inside buildings occurs less rapidly than that in ambient air, some accumulation of contaminants is possible where high concentrations of VOCs are present in the subsurface below buildings. In addition, heating systems can, in theory, create a negative pressure that can enhance flow of soil gas into buildings. No such consistent pressure gradient will exist to promote flow of soil gas to outdoor ambient air. The indoor air pathway is theoretically complete for current and future commercial/industrial workers. In order to complete the evaluation of vapor intrusion, soil data are used qualitatively to assess the potential for impacts to indoor air. Quantitative risk estimates are based on measured VOC concentrations in air in buildings onsite and adjacent to the site.

VOCs in groundwater could also volatilize to soil gas and migrate to indoor air. However, these vapors would exist below the 30 foot clay unit and vertical migration would probably be minimal. Also, any VOCs originating from groundwater would be reflected in shallow soil gas samples collected at the site, and any VOCs intruding into buildings would be reflected in indoor air samples collected within these buildings.

#### **3.3.2.5 Inhalation of Indoor Air – Volatilization during Groundwater Use**

As noted above, groundwater underlying the Site and in the immediate vicinity is currently not used for any purpose nor is it likely to be used for potable use in the future due to high concentrations of TDS. As such, this groundwater exposure pathway is incomplete.

#### **3.3.2.6 Inhalation of Ambient Air**

Volatile COPCs in the subsurface could migrate to the surface and be released to ambient air. Construction workers and on-site industrial workers who are outdoors could inhale these chemicals. Release of vapors does not require excavation or exposure of contaminated soils to air. Vapors may migrate through the vadose zone to the surface and be released as a consequence of barometric pumping and diffusion. Such exposures, however, will be greatly reduced by barriers to vapor migration such as buildings or pavement that currently cover portions of the site, or could be placed on the site if redeveloped. Furthermore, because the atmosphere outside has no boundaries, any vapors that rise to surface and are released to ambient air will be quickly dispersed and concentrations would be low. Vapors migrating to indoor air are likely to present a more important exposure pathway for commercial/industrial workers because they will spend large amounts of time indoors, and because the building and foundation represent a "trap" for migrating gases. Conclusions

developed for indoor exposure to vapors should be protective of ambient exposure to vapors. Exposure to vapors of COPCs released to ambient air were not further evaluated.

## **3.4 Exposure Parameter Assumptions**

Exposure assumptions for the receptors and exposure pathways of concern are discussed below and presented in Table 3-2. A number of exposure assumptions apply to most or all exposure pathways and are discussed separately. The following sections provide pathway-specific and general exposure assumptions developed from site-specific and EPA default exposure information.

### **3.4.1 General Exposure Assumptions**

#### **3.4.1.1 Body Weight**

In accordance with U.S. EPA guidance (1989), the value for body weight is the average weight of the receptor over the exposure period. For estimating exposures for commercial/industrial workers and construction workers, a body weight of 70 kg is used as recommended by U.S. EPA (1989, 1991) and Cal EPA (1992, 2005d).

#### **3.4.1.2 Body Surface Area**

For commercial/industrial and construction workers, a total body surface area that is dermally exposed is assumed to be 3,300 cm<sup>2</sup>/event (EPA, 2001; CalEPA, 2005d). This surface area basically assumes that arms, hands and head will all be exposed at each event. Cooler weather or work that does not involve excavation, grading or other soil moving activities would likely result in lesser exposure. The dermal adherence factor or contact rate is assumed to be 0.37 mg/cm<sup>2</sup> for the construction worker. This factor is the sum of the geometric mean of post-activity soil loadings onto hands, arms, and face of a construction worker (EPA, 1997). The dermal adherence factor or contact rate for commercial/industrial workers is assumed to be 0.2 mg/cm<sup>2</sup> (CalEPA, 2005). These rates are estimates of soil adherence to skin and varies based on moisture content, part of the body, and type of activity.

#### **3.4.1.3 Averaging Time**

Averaging time is the period in days over which intake is averaged. For noncarcinogenic chemicals, intakes are averaged over the exposure duration (exposure duration [years] \* 365 days/year). For carcinogens, intake calculations average the total cumulative dose over a lifetime (70 years \* 365 days/year). Averaging times differ for carcinogens and noncarcinogens because the effects of carcinogenic chemicals are assumed to have no threshold. Therefore, any exposure to a carcinogen carries a finite risk of cancer during the individual's lifetime. Within reason, this means that a single large exposure to a carcinogen is expected to carry the same risk as the same dose divided into many small exposures. Therefore, carcinogen intakes are expressed in terms of lifetime exposures, regardless of the actual exposure duration (EPA, 1989).

#### **3.4.1.4 Exposure Frequency**

The exposure frequency is the number of days per year that an individual participates in a particular activity. For the commercial/industrial worker scenario, the exposure frequency is 250 days per year (EPA, 1989; CalEPA 2005d). Construction workers would not work in an excavation or with exposed soils for the entire duration of construction; therefore, the exposure frequency for construction workers was assumed to be 60 days per year. This frequency is the equivalent to about 12 weeks or 3 months of construction time spent entirely within an excavation.

#### **3.4.1.5 Exposure Duration**

Exposure duration is the number of years over which exposure may occur. For the commercial/industrial worker, an exposure duration of 25 years is used (EPA, 1997; CalEPA, 2005d). For construction workers, an exposure duration of 1 year was assumed. This duration is a typical construction period for a building or home.

#### **3.4.1.6 Exposure Time**

Exposure time is the number of hours per day spent at the site. For the commercial/industrial worker, an exposure time of 8 hours is used to represent the typical workday. For the construction worker, an exposure time of 10 hours is used to represent the typical workday.

### **3.4.2 Pathway-Specific Exposure Assumptions**

Several exposure parameters apply to specific exposure pathways and are described below.

#### **3.4.2.1 Soil and Interior Dust Ingestion**

A soil ingestion rate of 100 mg per day is used for the RME commercial/industrial worker scenario (CalEPA, 2005d). A CTE ingestion rate of 50 mg per day is used for the commercial/industrial worker to address some potential variability in this factor.

There is no standard ingestion rate for construction workers. To address the potential variability in this factor, RME and CTE scenarios were developed. CTE and the RME soil ingestion rates of 100 and 480 mg per day, respectively, are used for the construction worker (EPA 1997). The CTE ingestion rate of 100 mg per day is equivalent to the common default value used by both DTSC and EPA for an adult. The RME ingestion rate of 480 mg per day is equivalent to the soil ingestion of an adult working outdoors in the summer.

#### **3.4.2.2 Inhalation of Fugitive Dust**

The inhalation rate used for adult commercial/industrial workers under the CTE scenario is 20 m<sup>3</sup> per day, which is equivalent to 0.83 m<sup>3</sup> per hour (CalEPA, 2005d). To address some potential variability in this factor, an inhalation rate of 28.8 m<sup>3</sup> per day, which is equivalent to 1.2 m<sup>3</sup> per hour is used for the commercial/industrial workers under the RME scenario.

No standard inhalation rates are available for construction workers. To address the potential variability in this factor, RME and CTE scenarios were developed. The CTE and RME inhalation rates used for adult construction workers are 2.5 and 4.8 m<sup>3</sup> per hour, respectively (EPA, 1997). This 2.5 m<sup>3</sup> per hour estimate is based on the inhalation rate of an adult male involved in moderate activities, such as major indoor repairs and alterations and climbing stairs. The 4.8 m<sup>3</sup> per hour estimate is based on the inhalation rate of an adult male involved in heavy activities, such as vigorous physical exercise and climbing stairs while carrying a load. Activities listed are only examples of the level of effort for different inhalation rates. Outdoor construction workers would be engaged in other tasks, but the level of effort implied is still appropriate. Since it is unlikely that a construction worker will be engaged in these levels of activities for their entire 10-hour workday for every workday of the year, use of these inhalation estimates is assumed to be conservative.

### 3.4.2.3 Inhalation of Indoor Air

Inhalation of indoor air was evaluated using measured indoor air concentrations to directly estimate risk related to indoor air exposure. The single exception was the evaluation of the parcel to the south of the site where the former Skateland facility existed. This building will soon be demolished and indoor air data for the building are no longer relevant. For this parcel, risk estimates were based on measured concentrations of VOCs in soil gas. The USEPA advanced soil gas spreadsheet implementation of (Windows™ - Excel) the Johnson and Ettinger vapor intrusion model (SG\_ADV\_Feb04.xls last modified February, 2004) was used to estimate potential indoor air concentrations from soil gas concentrations by calculating flux of chemicals through a foundation, taking into account building size and ventilation. The following site-specific criteria were entered into the model:

- Soil gas data from only the shallow depths sampled (0 to 6 feet bgs) were used because soil gas from the shallow portion of the vadose zone would be the most likely to migrate into onsite buildings. For the model soil gas sample depth was assumed to be 5 feet bgs.
- An average soil temperature of 67°F (19.4°C) was assumed per Figure A-1 in DTSC Indoor Air Guidance (Feb. 2005)
- Site soil was assumed to be clay, consistent with data from soil borings.
- The model was adjusted to account for an exposure time of 8 hours per day, which is typical for a commercial worker. Similarly, the exposure frequency and duration were modified to 250 days per year and 25 years, respectively, to represent a typical commercial worker.

- Toxicity criteria were updated using the online Office of Environmental Health Hazard Assessment (OEHHA) Toxicity Criteria Database<sup>2</sup> (first priority) and the online USEPA Integrated Risk Information System (IRIS)<sup>3</sup> database.
- The exchange rate was changed to a value of 1.0 air exchanges per hour. This value is consistent with the minimal ventilation requirements per the 2001 Energy Efficiency Standards for Nonresidential Buildings.<sup>4</sup> This ventilation rate is appropriate for a commercial/industrial facility.

Other model input parameters include the physical/chemical properties of COPCs. Chemical properties (such as air and water diffusivities and Henry's law constants) were either found in the model, researched for inclusion in the model or calculated using the references provided in the user's guide for the Johnson and Ettinger Model (EPA, 1997). Model defaults were used when site specific values were not available.

#### 3.4.2.4 Exposure to Lead

Risks for lead were evaluated using EPA's Adult Lead Methodology for occupational exposures and comparing to the threshold level of no more than 5 percent probability of blood lead levels exceeding 10 µg/dL. The EPA Adult Lead Methodology was used instead of the DTSC Leadsread model because EPA Adult Lead Methodology includes a calculation for blood lead levels for an adult worker fetus. In addition, the DTSC indicated in recent discussions that the Leadsread model was currently being revised and that they were not recommending its use.

Some key assumptions made in the EPA Adult Lead Methodology include:

- Exposure duration was revised to reflect 250 days per year, typical duration for a commercial/industrial worker.
- Exposure concentration for lead in soil was assumed to be 44.4 mg/kg (95% UCL for lead as shown in Table 3.1 for surface soil).

Default values were used for the remaining model parameters.

Lead calculations are presented in Appendix A. Risks from lead exposure are not calculated for the construction worker. A relatively constant lead intake over a minimum of 90 days, possibly more, is necessary to achieve a new quasi-steady state blood lead concentration and the exposure duration of the construction worker was

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<sup>2</sup> <http://www.oehha.ca.gov/risk/ChemicalDB/index.asp>

<sup>3</sup> <http://www.epa.gov/iris/subst/index.html>

<sup>4</sup> California Energy Commission 2001. Manual for Compliance with the 2001 Energy Efficiency Standards for Nonresidential Buildings, High-rise Residential Buildings, and Hotels/Motels). Document No P400-01-032. August.

estimated to be only 60 days. The Adult Lead Methodology is not capable of resolving such temporal effects.

### 3.5 Exposure Point Concentrations

Exposure point concentrations are estimated chemical concentrations a receptor will contact over an exposure period. Because of the uncertainty associated with any estimate of exposure, 95 percent upper confidence levels (UCLs) of the arithmetic mean are generally used as exposure point concentrations. Exposure point concentrations are calculated appropriately as 95 percent UCL of the arithmetic mean only when associated with an exposure unit within which exposures can reasonably be assumed to occur randomly. Exposure point concentrations are estimated using this approach for all COPCs for each exposure media identified for the site. EPA's statistical program *ProUCL* (EPA, 2001), were used to test data distributions and to compute UCLs of population means. For these calculations, non-detects were assumed to be equivalent to half of the detection limit. For datasets with less than 5 samples, the number of samples was too few to calculate a UCL and the maximum detected concentration was used as the exposure point concentration. Exposure point concentrations for all datasets assessed quantitatively are summarized in Tables 3-3 through 3-11.

### 3.6 Chemical Intake

The amount of chemical that is taken into a person's body following exposure is referred to as chemical intake. Intake is expressed in units of milligrams of chemical per kilogram of body weight per day (mg/kg-day), and is referred to as chronic daily intake (CDI). CDI depends on the concentration of chemicals in media at the point of human contact (exposure point concentration), and exposure assumptions specific to the receptor population, including frequency and duration of exposure, body weight, and contact rate. EPA guidance indicates that exposure assumptions should be chosen so that their combination results in an estimate of the reasonable maximum exposure (RME) for the exposure pathway. RME is the highest exposure that is within the range of possible exposures at the site (EPA, 1989). RME is designed to be conservative yet designed to prevent unrealistic, or "worst case" estimates from serving as the basis of risk management decisions. A range of exposure estimates is provided by estimating the central tendency exposure (CTE) for each exposure pathway. CTE uses exposure assumptions that predict an average exposure to an individual. Presentation of both the RME and CTE risks for the site provides the risk manager with a range of potential risks.

CDI are calculated using exposure point concentrations for the media of concern and the exposure assumptions described in Section 3. CDIs are estimated for each selected exposure pathway. The equations used to calculate CDIs for each exposure pathway are shown below.

### 3.6.1 Ingestion of Soils and Interior Dust

To determine CDIs associated with incidental ingestion of chemicals in solid media (e.g., surface soils and interior dust), the following equation is used (EPA, 1989).

$$CDI (mg/kgday) = \frac{CS \times IR \times CF \times FI \times EF \times ED \times BAF}{BW \times AT}$$

Where:

- CDI = Chronic Daily Intake ((mg/kg)/day)
- CS = Chemical Concentration in Soil or Dust (mg/kg)
- IR = Ingestion Rate (mg/day)
- CF = Conversion Factor (10<sup>-6</sup> kg/mg)
- FI = Fraction Ingested from Contaminated Source (unitless)
- EF = Exposure Frequency (days/year)
- ED = Exposure Duration (years)
- BAF = Bioavailability Factor for COPC in Soil or Dust (unitless)
- BW = Body Weight (kg)
- AT = Averaging Time (days)

### 3.6.2 Dermal Contact with Soils and Interior Dust

To determine CDIs associated with dermal contact with chemicals in solid media (e.g., surface soils and interior dust), the following equation is used (EPA, 1989).

$$CDI (mg/kgday) = \frac{CS \times SA \times AF \times ABS \times CF \times EF \times ED}{BW \times AT}$$

Where:

- CDI = Chronic Daily Intake ((mg/kg)/day)
- CS = Chemical Concentration in Soil or Dust (mg/kg)
- SA = Skin surface area exposed (cm<sup>2</sup>)
- AF = Soil to skin adherence factor (mg/cm<sup>2</sup>)
- ABS = Absorption fraction of chemical from soil

- CF = Conversion Factor (10<sup>-6</sup> kg/mg)  
EF = Exposure Frequency (days/year)  
ED = Exposure Duration (years)  
BW = Body Weight (kg)  
AT = Averaging Time (days)

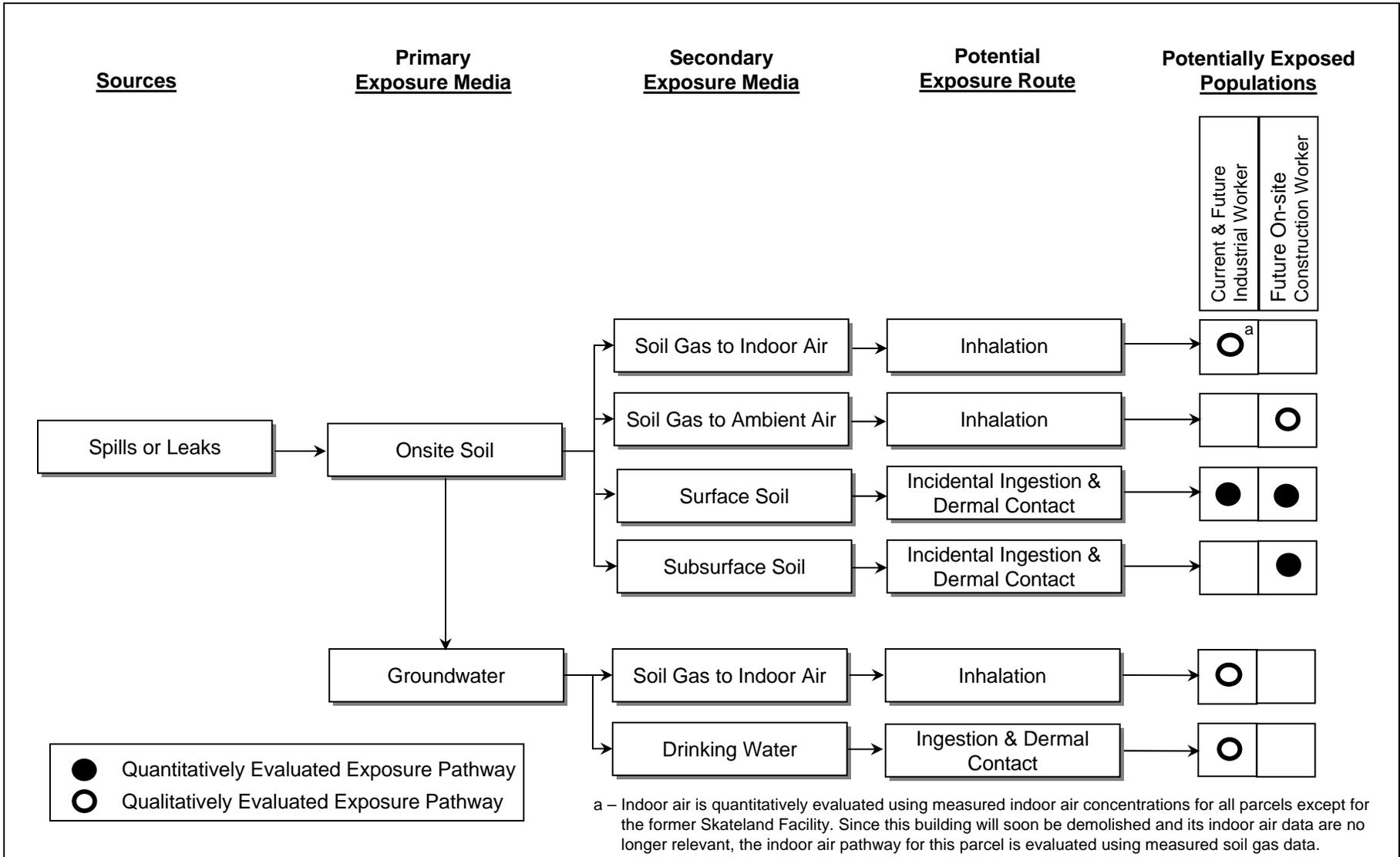
### 3.6.3 Inhalation of Fugitive Dust

To determine CDIs associated with inhalation of COPCs in fugitive dust, the following equation is used (EPA, 1989).

$$CDI (mg/kgday) = \frac{CA \times IhR \times ET \times EF \times ED}{BW \times AT}$$

Where:

- CDI = Chronic Daily Intake ((mg/kg)/day)  
CA = Chemical Concentration in Air (mg/m<sup>3</sup>)  
ET = Exposure Time (hours/day)  
IhR = Inhalation Rate (m<sup>3</sup>/hour)  
EF = Exposure Frequency (days/year)  
ED = Exposure Duration (years)  
BW = Body Weight (kg)  
AT = Averaging Time (days)



**Figure 3-1**  
**Site Conceptual Exposure Model – Omega Chemical Site**  
**Whittier, California**

**Table 3-1  
Summary of Receptors and Pathways of Concern**

Exposure Pathway	Receptors of Concern		
	Current and Future Industrial/ Commercial Workers	Current and Future Construction Workers	Current and Future Recreational Users
Indoor Air	Inhalation		Inhalation
Ambient Air		Inhalation <sup>1</sup>	
Surface Soil	Ingestion and Dermal Contact	Ingestion and Dermal Contact	
Subsurface Soil <sup>b</sup>		Ingestion and Dermal Contact	
<sup>a</sup> <sup>a</sup> Exposure to fugitive dust. <sup>b</sup> Subsurface soils were defined as soils from 18" to 30' bgs.			

**Table 3-2  
Exposure Parameters**

Exposure Parameter	Current and Future Industrial/Commercial Workers	Future Construction Worker
Body Weight (kg)	70 <sup>a,d</sup>	70 <sup>a,d</sup>
Averaging Time - Carcinogenic (days)	25,550 <sup>a,d</sup>	25,550 <sup>a,d</sup>
Averaging Time - Noncarcinogenic (days)	9,125 <sup>a,d</sup>	365 <sup>a</sup>
Exposure Frequency (days/yr)	250 <sup>d</sup>	60 <sup>b</sup>
Exposure Duration (years)	25 <sup>d</sup>	1 <sup>b</sup>
Exposure Time (hrs/day)	8	10
Ingestion Rate (mg/day)	RME = 100 <sup>b,d</sup> CTE = 50	RME = 480 <sup>b,c</sup> CTE = 100
Inhalation Rate (m <sup>3</sup> /hr)	RME = 1.2 <sup>b,d</sup> CTE = 0.83	RME = 4.8 <sup>b,c</sup> CTE = 2.5
Skin Surface Area Available for Contact (cm <sup>2</sup> /event)	3,300 <sup>d</sup>	3,300 <sup>d</sup>
Contact Rate (mg/cm <sup>2</sup> )	0.2 <sup>d</sup>	0.37 <sup>c</sup>

RME – reasonable maximum exposure

CTE – central tendency exposure

NA – not applicable

Sources: a – USEPA, 1989a. Risk Assessment Guidance for Superfund. Volume I - Human Health Evaluation Manual, Part A. EPA/540/1-89/002. Office of Emergency and Remedial Response. Washington D.C.

b – Site-specific. Professional judgment. See text.

c – USEPA, 1997. Exposure Factors Handbook. EPA/600/P-95/002Fa

d – CalEPA, 2005, Human Exposure Based Screening Numbers Developed to Aid Estimation of Cleanup Costs for Contaminated Soil. Appendix C. January revision.

**Table 3-3  
Summary of Exposure Point Concentrations for Surface Soil (0 to 1.5 ft bgs)**

<b>Chemical</b>	<b>Mean mg/kg</b>	<b>Maximum mg/kg</b>	<b>95 UCL mg/kg</b>	<b>95-UCL Statistic</b>	<b>Exposure Point Concentration mg/kg</b>	<b>Exposure Point Concentration Statistic</b>
2-METHYLNAPHTHALENE	0.72	0.48	3.32	UCL-NP	0.48	Max
BIS(2-ETHYLHEXYL)PHTHALATE	4.51	51	19	95% UCL-T	19.43	95% UCL-T
CHROMIUM	38.12	308.57143	99	UCL-NP	98.88	UCL-NP
CHROMIUM VI	6.35	51.428571	16.48	UCL-NP	16.48	UCL-NP
DIELDRIN	0.01	0.05	0.02	UCL-NP	0.02	UCL-NP
IRON	22,650.00	23200	NO UCL	UCL-NP	23,200	Max
LEAD	32.15	100	44.40	95% UCL-G	44.40	95% UCL-G
NAPHTHALENE	0.75	1.2	3.36	UCL-NP	1.20	Max
PCB-1254 (AROCOR 1254)	0.0302	0.5	0.25	UCL-NP	0.25	UCL-NP
PHENANTHRENE	0.7492	0.03	3.61	UCL-NP	0.03	Max

- (1) The arithmetic mean and the 95UCL were calculated including half the detection limit for the non-detects. As a result, in some cases these values are above the maximum detected.
- (2) The maximum listed here is the maximum value in the dataset used for the calculation of UCLs. This dataset includes half the detection limit for the non-detects. As a result, in some cases these maximum values are above the maximum detected.
- (3) Chromium concentrations were divided between Chromium III and Chromium VI assuming a 1:6 ratio of Cr VI:Cr III
- (4) Statistics: Maximum Detected Value (Max); 95% UCL of Normal Data (95% UCL-N); 95% UCL of Log-transformed Data (95% UCL-T); Non-parametric UCL (UCL-NP); 95% UCL assuming Gamma distribution (95% UCL-G).
- UCL = Upper Confidence Level  
mg/kg = milligram per kilogram

**Table 3-4  
Summary of Exposure Point Concentrations for Surface and Subsurface Soil (0 to 30 ft bgs)**

Chemical	Mean mg/kg	Maximum mg/kg	95 UCL mg/kg	95-UCL Statistic	Exposure Point Concentration mg/kg	Exposure Point Concentration Statistic
1,1,1-TRICHLOROETHANE	33.59	1200	264	UCL-NP	264	UCL-NP
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	16.81	590	125	UCL-NP	125	UCL-NP
1,1-DICHLOROETHENE	2.09	60	12.63	UCL-NP	12.63	UCL-NP
1,2-DICHLOROETHANE	1.60	1.6	8.44	UCL-NP	1.60	Max
1,4-DIOXANE	2.69	41	15.95	UCL-NP	15.95	UCL-NP
2-METHYLNAPHTHALENE	0.45	0.54	1.84	UCL-NP	0.54	Max
BENZO(A)ANTHRACENE	0.51	2.4	2.08	UCL-NP	2.08	UCL-NP
BENZO(A)PYRENE	0.49	1.6	2.01	UCL-NP	1.60	Max
BENZO(B)FLUORANTHENE	0.47	0.91	1.97	UCL-NP	0.91	Max
BIS(2-ETHYLHEXYL)PHTHALATE	2.72	51	15.32	UCL-NP	15.32	UCL-NP
CHROMIUM	36.9	360	77.2	UCL-NP	77.22	UCL-NP
CHROMIUM VI	5.3	51.4	11.0	UCL-NP	11.03	UCL-NP
DIELDRIN	0.007	0.05	0.035	UCL-NP	0.04	UCL-NP
IRON	22,925	23200	23,579	95% UCL-N	23200	Max
LEAD	48	890	54	95% UCL-T	53.69	95% UCL-T
METHYLENE CHLORIDE	3.26	100	21.30	UCL-NP	21.30	UCL-NP
NAPHTHALENE	0.34	1.2	0.99	UCL-NP	0.99	UCL-NP
PCB-1254 (AROCLOR 1254)	0.03	0.5	0.08	UCL-NP	0.08	UCL-NP
PHENANTHRENE	0.56	5	2.39	UCL-NP	2.39	UCL-NP
TETRACHLOROETHENE	51.61	1300	317.45	UCL-NP	317	UCL-NP
TOLUENE	2.13	62	13.10	UCL-NP	13.10	UCL-NP
TRICHLOROETHENE	4.40	140	30.18	UCL-NP	30.18	UCL-NP
TRICHLOROFLUOROMETHANE (FREON 11)	6.55	220	47.33	UCL-NP	47.33	UCL-NP

(1) The arithmetic mean and the 95UCL were calculated including half the detection limit for the non-detects. As a result, in some cases these values are above the maximum detector

(2) The maximum listed here is the maximum value in the dataset used for the calculation of UCLs. This dataset includes half the detection limit for the non-detects. As a result, in some cases these maximum values are above the maximum detected.

(3) Chromium concentrations were divided between Chromium III and Chromium VI assuming a 1:6 ratio of Cr VI:Cr III

(4) Statistics: Maximum Detected Value (Max); 95% UCL of Normal Data (95% UCL-N); 95% UCL of Log-transformed Data (95% UCL-T); Non-parametric UCL (UCL-NP); 95% UCL assuming Gamma distribution (95% UCL-G).

UCL = Upper Confidence Level

mg/kg = milligram per kilogram

**Table 3-5  
Summary of Exposure Point Concentrations for Soil Gas (0 to 6 ft bgs) - South Parcel - Skateland**

Chemical	Mean ppbv	Maximum ppbv	95 UCL ppbv	95-UCL Statistic	Exposure Point Concentration ppbv	Exposure Point Concentration Statistic
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	80,204	330,000	1,014,061	95% UCL-G assumed	330000	Max
1,1-DICHLOROETHENE	46,487	210,000	562,808	95% UCL-G	210000	Max
1,2,4-TRIMETHYLBENZENE	194	3	2,284	95% UCL-G	3.0	Max
2,2,4-TRIMETHYLPENTANE	72	12	726	95% UCL-G assumed	12	Max
2-BUTANONE	68	3	1,069	95% UCL-G	2.6	Max
4-ETHYLTOLUENE	68	2	1,073	95% UCL-G	2.4	Max
ACETONE	306	78	1,286	95% UCL-G	78	Max
CARBON DISULFIDE	69	4	1,050	95% UCL-G	3.6	Max
CHLOROFORM	194	3	2,303	95% UCL-G	2.5	Max
DICHLORODIFLUOROMETHANE	415	1,900	5,338	95% UCL-G	1900	Max
HEXANE (N-HEXANE)	69	3	1,027	95% UCL-G	3.0	Max
TETRACHLOROETHENE	3,250	13,000	11,592	95% UCL-G	11592	95% UCL-G
TRICHLOROETHENE	2,538	7,800	18,355	95% UCL-G	7800	Max
TRICHLOROFLUOROMETHANE (FREON 11)	22,773	94,000	252,608	95% UCL-G	94000	Max

- (1) The arithmetic mean and the 95UCL were calculated including half the detection limit for the non-detects. As a result, in some cases these values are above the maximum detected.
- (2) The maximum listed here is the maximum value in the dataset used for the calculation of UCLs. This dataset includes half the detection limit for the non-detects. As a result, in some cases these maximum values are above the maximum detected.
- (3) Statistics: Maximum Detected Value (Max); 95% UCL of Normal Data (95% UCL-N); 95% UCL of Log-transformed Data (95% UCL-T); Non-parametric UCL (UCL-NP); 95% UCL assuming Gamma distribution (95% UCL-G).
- (4) Exposure point concentrations for soil gas were entered into the Johnson and Ettinger model to determine indoor air exposure point concentrations.
- UCL = Upper Confidence Level  
ppbv = parts per billion volume

**Table 3-6**  
**Summary of Exposure Point Concentrations for Indoor Air - Site Parcel**

<b>Chemical</b>	<b>Mean ppbv</b>	<b>Maximum ppbv</b>	<b>95 UCL ppbv</b>	<b>95-UCL Statistic</b>	<b>Exposure Point Concentration ppbv</b>	<b>Exposure Point Concentration Statistic</b>
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	1.34	3.90	2.16	95% UCL-N	2.16	95% UCL-N
1,1-DICHLOROETHENE	1.74	4	2.84	95% UCL-N	2.84	95% UCL-N
ACETONE	673	2,500	4,540	95% UCL-G	2500	Max
BENZENE	1.92	4	3.05	95% UCL-G	3.05	95% UCL-G
CARBON TETRACHLORIDE	0.33	0.11	2.31	UCL-NP	0.11	Max
CHLOROFORM	0.29	0.05	1.32	95% UCL-T	0.05	Max
DICHLORODIFLUOROMETHANE	0.61	0.62	1.00	95% UCL-T	0.62	Max
ETHYLBENZENE	2.78	11.00	5.94	95% UCL-G	5.94	95% UCL-G
METHYLENE CHLORIDE	13.94	74.00	77.72	95% UCL-G	74.0	Max
TETRACHLOROETHENE	2	5	3	95% UCL-N	2.71	95% UCL-N
TOLUENE	105	620	525	95% UCL-G assumed	525	95% UCL-G assumed
TRICHLOROETHENE	0.63	1.20	0.99	95% UCL-N	0.99	95% UCL-N
TRICHLOROFLUOROMETHANE (FREON 11)	1.12	2.40	1.64	95% UCL-N	1.64	95% UCL-N

- (1) The arithmetic mean and the 95UCL were calculated including half the detection limit for the non-detects. As a result, in some cases these values are above the maximum detected.
- (2) The maximum listed here is the maximum value in the dataset used for the calculation of UCLs. This dataset includes half the detection limit for the non-detects. As a result, in some cases these maximum values are above the maximum detected.
- (3) Statistics: Maximum Detected Value (Max); 95% UCL of Normal Data (95% UCL-N); 95% UCL of Log-transformed Data (95% UCL-T); Non-parametric UCL (UCL-NP); 95% UCL assuming Gamma distribution (95% UCL-G).

UCL = Upper Confidence Level

ppbv = parts per billion volume

**Table 3-7  
Summary of Exposure Point Concentrations for Indoor Air - North Parcel**

Chemical	Mean ppbv	Maximum ppbv	95 UCL ppbv	95-UCL Statistic	Exposure Point Concentration ppbv	Exposure Point Concentration Statistic
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	3.31	5.10	5.26	95% UCL-N	5.10	Max
1,1-DICHLOROETHENE	1.26	3	2.17	95% UCL-N	2.17	95% UCL-G
1,4-DICHLOROBENZENE	0.07	0.15	0.13	95% UCL-N	0.13	UCL-NP
ACETONE	365.02	1,400	6,982.00	95% UCL-G	1400	Max
BENZENE	0.31	0.33	0.33	95% UCL-N	0.33	Max
CARBON TETRACHLORIDE	0.14	0.13	0.17	95% UCL-N	0.13	Max
CHLOROFORM	0.07	0.07	0.10	95% UCL-N	0.07	Max
DICHLORODIFLUOROMETHANE	0.46	0.66	0.61	95% UCL-N	0.61	UCL-NP
ETHYLBENZENE	0.17	0.19	0.19	95% UCL-N	0.19	Max
METHYLENE CHLORIDE	1	1	1	95% UCL-N	1.36	UCL-NP
TETRACHLOROETHENE	1.12	3.30	4.16	95% UCL-G	3.30	Max
TRICHLOROETHENE	0.80	2.50	2.92	95% UCL-G assumed	2.50	Max
TRICHLOROFLUOROMETHANE (FREON 11)	1.29	2.10	1.95	95% UCL-N	1.95	95% UCL-T

(1) The arithmetic mean and the 95UCL were calculated including half the detection limit for the non-detects. As a result, in some cases these values are above the maximum detected.

(2) The maximum listed here is the maximum value in the dataset used for the calculation of UCLs. This dataset includes half the detection limit for the non-detects. As a result, in some cases these maximum values are above the maximum detected.

(3) Statistics: Maximum Detected Value (Max); 95% UCL of Normal Data (95% UCL-N); 95% UCL of Log-transformed Data (95% UCL-T); Non-parametric UCL (UCL-NP); 95% UCL assuming Gamma distribution (95% UCL-G).

UCL = Upper Confidence Level

ppbv = parts per billion volume

**Table 3-8  
Summary of Exposure Point Concentrations for Indoor Air - West Parcel**

<b>Chemical</b>	<b>Mean ppbv</b>	<b>Maximum ppbv</b>	<b>95 UCL ppbv</b>	<b>95-UCL Statistic</b>	<b>Exposure Point Concentration ppbv</b>	<b>Exposure Point Concentration Statistic</b>
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	1.88	3.40	No UCL	Too Few Samples for UCL	3.4	Max
1,1-DICHLOROETHENE	3.10	6	No UCL	Too Few Samples for UCL	5.7	Max
1,4-DICHLOROBENZENE	0.03	0.05	No UCL	Too Few Samples for UCL	0.045	Max
ACETONE	11.05	18	No UCL	Too Few Samples for UCL	18	Max
BENZENE	0.31	0.45	No UCL	Too Few Samples for UCL	0.45	Max
CARBON TETRACHLORIDE	0.07	0.11	No UCL	Too Few Samples for UCL	0.11	Max
CHLOROFORM	0.03	0.05	No UCL	Too Few Samples for UCL	0.048	Max
DICHLORODIFLUOROMETHANE	0.38	0.58	No UCL	Too Few Samples for UCL	0.58	Max
ETHYLBENZENE	0.23	0.36	No UCL	Too Few Samples for UCL	0.36	Max
METHYLENE CHLORIDE	0.29	0	No UCL	Too Few Samples for UCL	0.43	Max
TETRACHLOROETHENE	8.68	15.00	No UCL	Too Few Samples for UCL	15	Max
TRICHLOROETHENE	0.46	0.80	No UCL	Too Few Samples for UCL	0.8	Max
TRICHLOROFLUOROMETHANE (FREON 11)	0.75	1.20	No UCL	Too Few Samples for UCL	1.2	Max

- (1) The arithmetic mean and the 95UCL were calculated including half the detection limit for the non-detects. As a result, in some cases these values are above the maximum detected.
- (2) The maximum listed here is the maximum value in the dataset used for the calculation of UCLs. This dataset includes half the detection limit for the non-detects. As a result, in some cases these maximum values are above the maximum detected.
- (3) Statistics: Maximum Detected Value (Max); 95% UCL of Normal Data (95% UCL-N); 95% UCL of Log-transformed Data (95% UCL-T); Non-parametric UCL (UCL-NP); 95% UCL assuming Gamma distribution (95% UCL-G).

UCL = Upper Confidence Level  
ppbv = parts per billion volume

**Table 3-9**  
**Summary of Exposure Point Concentrations for Indoor Air - South Parcel - Bishop**

Chemical	Mean ppbv	Maximum ppbv	95 UCL ppbv	95-UCL Statistic	Exposure Point Concentration ppbv	Exposure Point Concentration Statistic
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	0.75	1.3	No UCL	Too Few Samples for UCL	1.3	Max
1,1-DICHLOROETHENE	1.95	3.6	No UCL	Too Few Samples for UCL	3.6	Max
1,4-DICHLOROBENZENE	0.04	0.053	No UCL	Too Few Samples for UCL	0.053	Max
ACETONE	14.12	17.35	No UCL	Too Few Samples for UCL	17.35	Max
BENZENE	0.38	0.39	No UCL	Too Few Samples for UCL	0.39	Max
CARBON TETRACHLORIDE	0.09	0.091	No UCL	Too Few Samples for UCL	0.091	Max
CHLOROFORM	0.03	0.036	No UCL	Too Few Samples for UCL	0.036	Max
DICHLORODIFLUOROMETHANE	0.58	0.605	No UCL	Too Few Samples for UCL	0.605	Max
ETHYLBENZENE	0.28	0.4	No UCL	Too Few Samples for UCL	0.4	Max
METHYLENE CHLORIDE	0	0.49	No UCL	Too Few Samples for UCL	0.49	Max
TETRACHLOROETHENE	2.27	4.3	No UCL	Too Few Samples for UCL	4.3	Max
TRICHLOROFLUOROMETHANE (FREON 11)	0.49	0.65	No UCL	Too Few Samples for UCL	0.65	Max

- (1) The arithmetic mean and the 95UCL were calculated including half the detection limit for the non-detects. As a result, in some cases these values are above the maximum detected.
- (2) The maximum listed here is the maximum value in the dataset used for the calculation of UCLs. This dataset includes half the detection limit for the non-detects. As a result, in some cases these maximum values are above the maximum detected.
- (3) Statistics: Maximum Detected Value (Max); 95% UCL of Normal Data (95% UCL-N); 95% UCL of Log-transformed Data (95% UCL-T); Non-parametric UCL (UCL-NP); 95% UCL assuming Gamma distribution (95% UCL-G).

UCL = Upper Confidence Level  
ppbv = parts per billion volume

**Table 3-10**  
**Summary of Exposure Point Concentrations for Indoor Air - South Parcel - LA Carts/Oncology Care**

Chemical	Mean ppbv	Maximum ppbv	95 UCL ppbv	95-UCL Statistic	Exposure Point Concentration ppbv	Exposure Point Concentration Statistic
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	0.69	1.90	1.45	95% UCL-N	1.9	95% UCL-N
1,1-DICHLOROETHENE	0.33	0.92	0.73	95% UCL-N	0.92	95% UCL-N
1,2-DICHLOROETHANE	0.048	0.080	0.077	95% UCL-N	0.08	95% UCL-N
1,4-DICHLOROBENZENE	0.048	0.065	0.070	95% UCL-N	0.065	Max
ACETONE	161	490	677	95% UCL-G	490	Max
BENZENE	0.47	0.68	0.60	95% UCL-N	0.68	95% UCL-N
CARBON TETRACHLORIDE	0.081	0.083	0.082	95% UCL-N	0.083	95% UCL-N
CHLOROFORM	0.089	0.14	0.13	95% UCL-N	0.14	95% UCL-N
DICHLORODIFLUOROMETHANE	0.61	0.68	0.67	95% UCL-N	0.68	95% UCL-N
ETHYLBENZENE	0.28	0.47	0.42	95% UCL-G assumed	0.47	95% UCL-G assumed
METHYLENE CHLORIDE	0.93	1.70	1.55	95% UCL-N	1.7	95% UCL-N
TETRACHLOROETHENE	0.091	0.24	0.25	95% UCL-G	0.24	Max
TOLUENE	43.28	150	286	95% UCL-G	150	Max
TRICHLOROFLUOROMETHANE (FREON 11)	0.40	0.57	0.53	95% UCL-N	0.57	95% UCL-N

(1) The arithmetic mean and the 95UCL were calculated including half the detection limit for the non-detects. As a result, in some cases these values are above the maximum detected.

(2) The maximum listed here is the maximum value in the dataset used for the calculation of UCLs. This dataset includes half the detection limit for the non-detects. As a result, in some cases these maximum values are above the maximum detected.

(3) Statistics: Maximum Detected Value (Max); 95% UCL of Normal Data (95% UCL-N); 95% UCL of Log-transformed Data (95% UCL-T); Non-parametric UCL (UCL-NP); 95% UCL assuming Gamma distribution (95% UCL-G).

UCL = Upper Confidence Level

ppbv = parts per billion volume

# Section 4

## Toxicity Assessment

The purpose of a toxicity assessment is to review and summarize available information on the potential for each chemical of potential concern (COPC) to cause adverse effects in exposed individuals. Adverse effects include both noncarcinogenic and carcinogenic health effects in humans. For most adverse effects caused by chemicals, a positive relationship exists between dose (intake of a chemical through a particular exposure pathway, such as ingestion) and response. Generally, as dose increases, type and severity of adverse response also increases. Further, time of onset of toxic responses often shortens.

A key facet of any toxicity assessment is the use of dose-response information to describe a quantitative relationship between human exposure and potential for adverse health effects. Quantitative toxicity criteria are generally numerical expressions developed by EPA of the relationship between chronic average daily dose (exposure) and toxic response (adverse health effects). As described below, separate toxicity criteria are developed for assessment of carcinogenic and noncarcinogenic health effects.

Sources of toxicity information included, in order of descending priority, are:

- Office of Environmental Health Hazard Assessment (CalEPA) Toxicity Criteria Database
- USEPA's Integrated Risk Information System (IRIS)
- USEPA criteria documents
- Agency for Toxic Substances and Disease Registry (ATSDR) Toxicological Profiles

This section explains how toxicity criteria for carcinogens and noncarcinogens are developed and expressed, and summarizes toxicity values for each COPC. The general basis for the development of toxicity values for carcinogens and noncarcinogens is presented in subsections 4.1 and 4.2, respectively, along with a summary of the toxicity values for all COPCs.

### 4.1 Carcinogens

#### 4.1.1 Evidence of Carcinogenicity

USEPA has developed a classification system for carcinogens, which characterizes the overall weight of evidence of carcinogenicity based on the availability of human, animal, and other supportive data. Three major factors are considered:

- The quality of evidence from human studies
- The quality of evidence from animal studies

- Other supportive data assessed to determine whether the overall weight of evidence should be modified

USEPA classification system for the characterization of the overall weight of carcinogenicity has the following five categories:

1. Human Carcinogen. This category indicates that there is sufficient evidence from epidemiological studies to support a causal association between an agent and cancer.
2. Probable Human Carcinogen. This category generally indicates that there is at least limited evidence from epidemiological studies of carcinogenicity to humans (Group B1) or that, in the absence of adequate data on humans, there is sufficient evidence of carcinogenicity in animals (Group B2).
3. Possible Human Carcinogen. This category indicates that there is limited evidence of carcinogenicity in animals in the absence of adequate data on humans.
4. Not Classified. This category indicates that the evidence for carcinogenicity in animals is inadequate.
5. Evidence of Noncarcinogenicity to Humans. This category indicates that there is evidence for noncarcinogenicity in at least two adequate animal tests in different species or in both epidemiological and animal studies.

#### 4.1.2 Cancer Slope Factors

Carcinogenic toxicity criteria are usually provided as cancer slope factors (CSFs) in units of excess risk per milligram of chemical per kilogram of body weight per day ((mg/kg-day)<sup>-1</sup>). These factors are based on the assumption that no threshold exists for carcinogenic effects and any dose is associated with some finite carcinogenic risk. Chemical-specific toxicity criteria for some of the carcinogens at the site are presented in Table 4-1.

USEPA has used a variety of specialized models to estimate the upper bound risk of carcinogenesis for a number of compounds. Data from animal or epidemiological studies are used to determine slope factors, which are expressed as (mg/kg-day)<sup>-1</sup> for a lifetime exposure. The CSF describes the increase in an individual's risk of developing cancer over a 70-year lifetime per unit of exposure where the unit of exposure is expressed as mg/kg-day.

CSFs are calculated using methods protective of human health and are based on the assumption that cancer risks decrease linearly with decreasing dose. The 95 percent upper confidence limit estimate for the slope is used in most cases to compensate for animal to human extrapolation and other uncertainties. The resulting CSFs are considered to be upper range estimates that are unlikely to underestimate carcinogenic potential in humans.

When the upper-bound CSF is multiplied by the lifetime average daily dose of a potential carcinogen, the product is the upper-bound lifetime individual cancer risk associated with exposure at that dose. The calculated risk is thus an estimate of the increased likelihood of cancer resulting from exposure to a chemical. For example, if the product of the CSF and the average daily dose is  $1 \times 10^{-6}$ , the predicted upper-bound cancer risk for the exposed population is one in one million, or 0.0001 percent. This risk is in addition to any "background" risk of cancer not related to the chemical exposure.

Calculation of risk often relies on data derived from chronic animal bioassays. The likelihood that an animal carcinogen is also a human carcinogen is a function of the following factors:

- The number of tissues affected by the chemical
- The number of animal species, strains, sexes, and number of experiments and doses showing a carcinogenic response
- The occurrence of clear-cut dose-response relationships as well as a high level of statistical significance of the increased tumor incidence in treated compared to control groups
- A dose-related decrease in time-to-tumor occurrence or time-to-death with tumor
- A dose-related increase in the proportion of malignant tumors

Animal studies are usually conducted using relatively high doses to observe adverse effects. Because humans are expected to be exposed at lower doses, data are adjusted using a mathematical model. Data from animal studies are fitted to a linearized multi-stage model and a dose-response curve is obtained. The low-dose slope of the dose-response curve is subjected to various adjustments (e.g., calculation of 95 percent UCL), and inter-species scaling factors are often applied to derive slope factors for humans. Dose-response data derived from human epidemiological studies are fitted to dose-time-response curves on an individual basis. These models provide conservative but plausible estimates of upper limits on lifetime risk. Although the actual risk is unlikely to be higher than the estimated risk, it could be considerably lower. In some instances, it may even be zero.

## 4.2 Noncarcinogens

Toxicity criteria for noncarcinogens, or for significant noncarcinogenic effects caused by carcinogens, are provided as reference doses (RfD) for oral and inhalation exposure and are expressed in units of milligram of chemical per kilogram of body weight per day (mg/kg-day). RfDs may be interpreted as thresholds below which adverse effects are not expected to occur in the most sensitive populations even if the exposure occurs continuously over a lifetime. Chemical-specific toxicity criteria for some of the noncarcinogens at the site are presented in Table 4-2.

RfDs are usually derived from no observable adverse effect levels (NOAELs) taken either from human studies, often involving workplace exposures, or from animal studies, and are adjusted downward using uncertainty or modifying factors. For example, a modifying factor of 2 to 10 may be applied if the database on a particular chemical lacks information on possible reproductive or developmental toxicity.

Uncertainty factors are generally applied to adjust for the possibility that humans are more sensitive than experimental animals and that there may be sensitive subpopulations of humans (e.g., children, pregnant women, individuals with hay fever or asthma). Depending upon the information available, other factors may also be applied.

RfDs are presented in units of mg/kg-day for comparison with estimated chronic daily intake into the body. Chronic exposure in this instance is not clearly defined, but need not be a lifetime exposure. Generally, exposures must continue for several years to be considered chronic. Intakes less than the RfD are not likely to cause adverse health effects. Chronic daily intakes greater than the RfD indicate a possibility for adverse effects. Whether such exposures actually produce adverse effects, however, is a function of a number of factors such as accuracy of uncertainty factors applied to the NOAEL, appropriateness of animal models used in studies extrapolated to humans, and potential for the chemical to cause effects in organs or systems (e.g., reproductive and immune systems) that have not been adequately studied. Generally, protective assumptions made by USEPA in deriving RfDs will, in most cases, mean that exposures slightly in excess of the RfD will be associated with a low risk for adverse effects, with the probability of adverse effects increasing with increasing exposure.

RfDs can be generated for subchronic exposures as well as chronic exposures. Subchronic is generally assumed to be exposures of several weeks to a few years. Since construction workers at the site are expected to be exposed for no more than 60 days (see Table 3-2), a subchronic reference dose is most appropriate for assessing risks to these receptors. Subchronic RfDs are derived in the same manner as RfDs for chronic exposure, except that data from shorter term animal studies, or human exposures, are used.

EPA has not published conventional quantitative toxicity criteria for lead because available data suggest a very low or possibly no threshold for adverse effects, even at exposure levels that might be considered background. Any significant increase above such background exposures could represent a cause for some concern. In lieu of evaluating risk using typical intake calculations and toxicity criteria, DTSC has developed a spreadsheet model for prediction of blood-lead levels in receptors exposed to lead from a variety of sources, including soil, dust, air, and water. Estimated blood-lead levels are compared to target blood-lead concentrations to assess possible risks. This model is further discussed in Section 5.

Inhalation toxicity values for some of the constituents at the site are provided in Tables 4-3 and 4-4.

**Table 4-1  
Cancer Toxicity Data - Oral/Dermal  
Omega Chemical Site - Whittier, California**

Chemical of Potential Concern	Oral Cancer Slope Factor		Oral Absorption Efficiency for Dermal  (1)	Absorbed Cancer Slope Factor for Dermal		Weight of Evidence/ Cancer Guideline Description	Oral Cancer Slope Factor	
	Value	Units		Value	Units		Source(s)	Date(s) (MM/DD/YYYY)
1,2-DICHLOROETHANE	9.1E-02	mg/kg/day-1	10%	9.1E-03	mg/kg/day-1	B2	IRIS	11/30/2006
1,4-DICHLOROBENZENE	5.4E-03	mg/kg/day-1	10%	5.4E-04	mg/kg/day-1	2B	OEHHA	11/30/2006
1,4-DIOXANE	2.7E-02	mg/kg/day-1	3%	8.1E-04	mg/kg/day-1	B2	OEHHA	11/30/2006
BENZENE	1.0E-01	mg/kg/day-1	10%	1.0E-02	mg/kg/day-1	A	OEHHA	11/30/2006
BENZO(A)ANTHRACENE	1.2E+00	mg/kg/day-1	15%	1.8E-01	mg/kg/day-1	B2	OEHHA	11/30/2006
BENZO(A)PYRENE	1.2E+01	mg/kg/day-1	15%	1.8E+00	mg/kg/day-1	B2	OEHHA	11/30/2006
BENZO(B)FLUORANTHENE	1.2E+00	mg/kg/day-1	15%	1.8E-01	mg/kg/day-1	B2	OEHHA	11/30/2006
BIS(2-ETHYLHEXYL)PHTHALATE	1.4E-02	mg/kg/day-1	10%	1.4E-03	mg/kg/day-1	B2	IRIS	11/30/2006
CARBON TETRACHLORIDE	1.5E-01	mg/kg/day-1	10%	1.5E-02	mg/kg/day-1	B2	OEHHA	11/30/2006
CHLOROFORM	3.1E-02	mg/kg/day-1	10%	3.1E-03	mg/kg/day-1	B2	OEHHA	11/30/2006
DIELDRIN	1.6E+01	mg/kg/day-1	5%	8.0E-01	mg/kg/day-1	B2	OEHHA	11/30/2006
LEAD	8.5E-03	mg/kg/day-1	1%	8.5E-05	mg/kg/day-1	B2	OEHHA	11/30/2006
METHYLENE CHLORIDE	1.4E-02	mg/kg/day-1	10%	1.4E-03	mg/kg/day-1	B2	OEHHA	11/30/2006
NAPHTHALENE	1.2E-01	mg/kg/day-1	15%	1.8E-02	mg/kg/day-1	C	EPA-Region 9	10/01/2004
PCB-1254 (AROCOR 1254)	5.0E+00	mg/kg/day-1	15%	7.5E-01	mg/kg/day-1	B2	OEHHA	11/30/2006
TETRACHLOROETHENE	5.4E-01	mg/kg/day-1	10%	5.4E-02	mg/kg/day-1	2B	OEHHA	11/30/2006
TETRAHYDROFURAN	7.6E-03	mg/kg/day-1	10%	7.6E-04	mg/kg/day-1		EPA-Region 9	10/01/2004
TRICHLOROETHENE	1.3E-02	mg/kg/day-1	10%	1.3E-03	mg/kg/day-1	2A	OEHHA	11/30/2006

Footnotes:

(1) Oral Absorption Efficiency for Dermal contact was conservatively selected as 100%.

OEHHA: Office of Health Hazard Assessment online toxicity database

EPA-Region 9: USEPA Region IX Preliminary Remediation Goals Tables

IRIS: USEPA Integrated Risk Information System online toxicity database

na: No value is available.

mg/kg/day-1: milligram per kilogram-day.

IARC: International Agency for Research on Cancer

A: Human Carcinogen

2A: IARC designation for probably carcinogenic to humans

B: Probable Human Carcinogen. This category generally indicates that there is at least limited evidence from epidemiological studies of carcinogenicity to humans (Group B1) or that, in the absence of adequate data on humans, there is sufficient evidence of carcinogenicity in animals (Group B2).

2B: IARC designation for possibly carcinogenic to humans

C: Possible Human Carcinogen.

**Table 4-2  
Non-cancer Toxicity Data - Oral/Dermal  
Omega Chemical Site - Whittier, California**

Chemical of Potential Concern	Chronic/ Subchronic	Oral RfD		Oral Absorption Efficiency for Dermal (1)	Absorbed RfD for Dermal		Primary Target Organ(s)	Combined Uncertainty/Modifying Factors	RfD:Target Organ(s)	
		Value	Units		Value	Units			Source(s)	Date(s) (MM/DD/YYYY)
1,1,1-TRICHLOROETHANE	chronic	2.8E-01	mg/kg/day	10%	2.8E+00	mg/kg/day	CNS Liver toxicity	10 100	EPA-Region 9	10/01/2004
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	chronic	3.0E-01	mg/kg/day	10%	3.0E+00	mg/kg/day			IRIS	11/30/2006
1,1-DICHLOROETHENE	chronic	5.0E-02	mg/kg/day	10%	5.0E-01	mg/kg/day			IRIS	11/30/2006
1,2,4-TRIMETHYLBENZENE	chronic	5.0E-02	mg/kg/day	10%	5.0E-01	mg/kg/day	EPA-Region 9 EPA-Region 9 EPA-Region 9	10/01/2004 10/01/2004 10/01/2004		
1,2-DICHLOROETHANE	chronic	2.0E-02	mg/kg/day	10%	2.0E-01	mg/kg/day				
1,4-DICHLOROBENZENE	chronic	3.0E-02	mg/kg/day	10%	3.0E-01	mg/kg/day				
1,4-DIOXANE	chronic	NA	mg/kg/day	3%	NA	mg/kg/day	Dec. offspring weight Pulmonary alveolar proteinosis	1,000 1,000	IRIS	11/30/2006
2,2,4-TRIMETHYLPENTANE	chronic	NA	mg/kg/day	10%	NA	mg/kg/day			IRIS	11/30/2006
2-BUTANONE	chronic	6.0E-01	mg/kg/day	10%	6.0E+00	mg/kg/day			IRIS	11/30/2006
2-METHYLNAPHTHALENE	chronic	4.0E-03	mg/kg/day	10%	4.0E-02	mg/kg/day	Kidney Dec. lymphocyte count	1,000 300	IRIS	11/30/2006
4-ETHYLTOLUENE	chronic	NA	mg/kg/day	10%	NA	mg/kg/day			IRIS	11/30/2006
ACETONE	chronic	9.0E-01	mg/kg/day	10%	9.0E+00	mg/kg/day			IRIS	11/30/2006
BENZENE	chronic	4.0E-03	mg/kg/day	10%	4.0E-02	mg/kg/day	Inc. liver weight Fetal toxicity Liver lesions	1,000 100 1,000	IRIS	11/30/2006
BENZO(A)ANTHRACENE	chronic	NA	mg/kg/day	15%	NA	mg/kg/day			IRIS	11/30/2006
BENZO(A)PYRENE	chronic	NA	mg/kg/day	15%	NA	mg/kg/day			IRIS	11/30/2006
BENZO(B)FLUORANTHENE	chronic	NA	mg/kg/day	15%	NA	mg/kg/day	Liver and kidney toxicity	1,000	IRIS	11/30/2006
BIS(2-ETHYLHEXYL)PHTHALATE	chronic	2.0E-02	mg/kg/day	10%	2.0E-01	mg/kg/day			IRIS	11/30/2006
CARBON DISULFIDE	chronic	1.0E-01	mg/kg/day	10%	1.0E+00	mg/kg/day			IRIS	11/30/2006
CARBON TETRACHLORIDE	chronic	7.0E-04	mg/kg/day	10%	7.0E-03	mg/kg/day	None None	100 100	IRIS	11/30/2006
CHLOROFORM	chronic	1.0E-02	mg/kg/day	10%	1.0E-01	mg/kg/day			IRIS	11/30/2006
CHROMIUM	chronic	1.5E+00	mg/kg/day	1%	1.5E+02	mg/kg/day			IRIS	11/30/2006
CHROMIUM VI	chronic	3.0E-03	mg/kg/day	1%	NA	mg/kg/day	Dec. body weight Liver	100 100	IRIS	11/30/2006
DICHLORODIFLUOROMETHANE	chronic	2.0E-01	mg/kg/day	10%	2.0E+00	mg/kg/day			IRIS	11/30/2006
DIELDRIN	chronic	5.0E-05	mg/kg/day	5%	1.0E-03	mg/kg/day			IRIS	11/30/2006
ETHYLBENZENE	chronic	1.0E-01	mg/kg/day	10%	1.0E+00	mg/kg/day	Liver and kidney toxicity	1,000	IRIS	11/30/2006
HEXANE (N-HEXANE)	chronic	1.1E+01	mg/kg/day	10%	1.1E+02	mg/kg/day			EPA-Region 9	10/01/2004
IRON	chronic	3.0E-01	mg/kg/day	1%	3.0E+01	mg/kg/day			EPA-Region 9	10/01/2004
LEAD	chronic	NA	mg/kg/day	1%	NA	mg/kg/day	Dec. body weight in males Ocular exudate	3,000 300	IRIS	11/30/2006
METHYLENE CHLORIDE	chronic	6.0E-02	mg/kg/day	10%	6.0E-01	mg/kg/day			IRIS	11/30/2006
NAPHTHALENE	chronic	2.0E-02	mg/kg/day	15%	1.3E-01	mg/kg/day			IRIS	11/30/2006
PCB-1254 (AROCOR 1254)	chronic	2.0E-05	mg/kg/day	15%	1.3E-04	mg/kg/day	Liver toxicity in mice	1,000	IRIS	11/30/2006
PHENANTHRENE	chronic	NA	mg/kg/day	15%	NA	mg/kg/day			IRIS	11/30/2006
TETRACHLOROETHENE	chronic	1.0E-02	mg/kg/day	10%	1.0E-01	mg/kg/day			IRIS	11/30/2006
TETRAHYDROFURAN	chronic	2.1E-01	mg/kg/day	10%	2.1E+00	mg/kg/day	Inc. kidney weight	3,000	EPA-Region 9	10/01/2004
TOLUENE	chronic	8.0E-02	mg/kg/day	10%	8.0E-01	mg/kg/day			IRIS	11/30/2006
TRICHLOROETHENE	chronic	3.0E-04	mg/kg/day	10%	3.0E-03	mg/kg/day			EPA-Region 9	10/01/2004
TRICHLOROFLUOROMETHANE (FREON 11)	chronic	3.0E-01	mg/kg/day	10%	3.0E+00	mg/kg/day	Survival and histopathology	1,000	IRIS	11/30/2006

Footnotes:

(1) Oral Absorption Efficiency for Dermal contact was conservatively selected as 100%.

EPA-Region 9: USEPA Region IX Preliminary Remediation Goals Tables

IRIS: USEPA Integrated Risk Information System online toxicity database

na: No value is available.

CNS: Central Nervous System.

mg/kg/day: milligram per kilogram per day.

**Table 4-3  
Cancer Toxicity Data - Inhalation  
Omega Chemical Site - Whittier, California**

Chemical of Potential Concern	Unit Risk		Inhalation Cancer Slope Factor		Weight of Evidence/ Cancer Guideline Description	Unit Risk : Inhalation CSF	
	Value	Units	Value	Units		Source(s)	Date(s) (MM/DD/YYYY)
1,2-DICHLOROETHANE	2.6E-05	(ug/m3)-1	9.1E-02	mg/kg/day-1	B2	IRIS	11/30/2006
1,4-DICHLOROBENZENE	1.1E-05	(ug/m3)-1	4.0E-02	mg/kg/day-1	2B	OEHHA	11/30/2006
1,4-DIOXANE	7.7E-06	(ug/m3)-1	2.7E-02	mg/kg/day-1	B2	OEHHA	11/30/2006
BENZENE	2.9E-05	(ug/m3)-1	1.0E-01	mg/kg/day-1	A	OEHHA	11/30/2006
BENZO(A)ANTHRACENE	1.1E-04	(ug/m3)-1	3.9E-01	mg/kg/day-1	B2	OEHHA	11/30/2006
BENZO(A)PYRENE	1.1E-03	(ug/m3)-1	3.9E+00	mg/kg/day-1	B2	OEHHA	11/30/2006
BENZO(B)FLUORANTHENE	1.1E-04	(ug/m3)-1	3.9E-01	mg/kg/day-1	B2	OEHHA	11/30/2006
BIS(2-ETHYLHEXYL)PHTHALATE	2.4E-06	(ug/m3)-1	8.4E-03	mg/kg/day-1	B2	OEHHA	11/30/2006
CARBON TETRACHLORIDE	4.3E-05	(ug/m3)-1	1.5E-01	mg/kg/day-1	B2	OEHHA	11/30/2006
CHLOROFORM	2.3E-05	(ug/m3)-1	8.1E-02	mg/kg/day-1	B2	IRIS	11/30/2006
CHROMIUM VI	1.5E-01	(ug/m3)-1	5.1E+02	mg/kg/day-1	A	OEHHA	11/30/2006
DIELDRIN	4.6E-03	(ug/m3)-1	1.6E+01	mg/kg/day-1	B2	OEHHA	11/30/2006
LEAD	1.2E-05	(ug/m3)-1	4.2E-02	mg/kg/day-1	B2	OEHHA	11/30/2006
METHYLENE CHLORIDE	1.0E-06	(ug/m3)-1	3.5E-03	mg/kg/day-1	B2	OEHHA	11/30/2006
NAPHTHALENE	3.4E-05	(ug/m3)-1	1.2E-01	mg/kg/day-1	C	OEHHA	11/30/2006
PCB-1254 (AROCLOR 1254)	5.7E-04	(ug/m3)-1	2.0E+00	mg/kg/day-1	B2	IRIS	11/30/2006
TETRACHLOROETHENE	5.9E-06	(ug/m3)-1	2.1E-02	mg/kg/day-1	2B	OEHHA	11/30/2006
TETRAHYDROFURAN	1.9E-06	(ug/m3)-1	6.8E-03	mg/kg/day-1		EPA-Region 9	10/01/2004
TRICHLOROETHENE	2.0E-06	(ug/m3)-1	7.00E-03	mg/kg/day-1	2A	OEHHA	11/30/2006

Footnotes:

OEHHA: Office of Health Hazard Assessment online toxicity database  
 EPA-Region 9: USEPA Region IX Preliminary Remediation Goals Tables  
 IRIS: USEPA Integrated Risk Information System online toxicity database  
 na: No value is available  
 (ug/m<sup>3</sup>)<sup>-1</sup>: cubic meter per microgram  
 mg/kg/day<sup>-1</sup>: milligram per kilogram-day  
 IARC: International Agency for Research on Cancer

A: Human Carcinogen  
 B: Probable Human Carcinogen. This category generally indicates that there is at least limited evidence from epidemiological studies of carcinogenicity to humans (Group B1) or that, in the absence of adequate data on humans, there is sufficient evidence of carcinogenicity in animals (Group B2).  
 2B: IARC designation for possibly carcinogenic to humans  
 C: Possible Human Carcinogen

**Table 4-4  
Non-cancer Toxicity Data - Inhalation  
Omega Chemical Site - Whittier, California**

Chemical of Potential Concern	Chronic/ Subchronic	Inhalation RfC		Inhalation RfD		Primary Target Organ(s)	Combined Uncertainty/Modifying Factors	RfC : Target Organ(s)	
		Value	Units	Value	Units			Source(s)	Date(s) (MM/DD/YYYY)
1,1,1-TRICHLOROETHANE	chronic	2.2E+00	mg/m3	6.3E-01	mg/kg/day	Liver toxicity	30	EPA-Region 9	10/01/2004
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	chronic	NA	mg/m3	NA	mg/kg/day			IRIS	11/30/2006
1,1-DICHLOROETHENE	chronic	2.0E-01	mg/m3	5.7E-02	mg/kg/day	CNS, RESP, liver, kidney ALIM, Kidney, CVS	100	EPA-Region 9	10/01/2004
1,2,4-TRIMETHYLBENZENE	chronic	6.0E-03	mg/m3	1.7E-03	mg/kg/day			OEHHA	11/30/2006
1,2-DICHLOROETHANE	chronic	4.9E-03	mg/m3	1.4E-03	mg/kg/day			OEHHA	11/30/2006
1,4-DICHLOROBENZENE	chronic	8.0E-01	mg/m3	2.3E-01	mg/kg/day			IRIS	11/30/2006
1,4-DIOXANE	chronic	3.0E+00	mg/m3	8.6E-01	mg/kg/day	DEV	300	IRIS	11/30/2006
2,2,4-TRIMETHYLPENTANE	chronic	NA	mg/m3	NA	mg/kg/day				
2-BUTANONE	chronic	5.0E+00	mg/m3	1.4E+00	mg/kg/day	Hematopoetic system, DEV, CNS,	300	EPA-Region 9	10/01/2004
2-METHYLNAPHTHALENE	chronic	NA	mg/m3	NA	mg/kg/day			IRIS	11/30/2006
4-ETHYLTOLUENE	chronic	NA	mg/m3	NA	mg/kg/day	Peripheral nervous system ALIM, DEV, CNS	30	IRIS	11/30/2006
ACETONE	chronic	3.2E+00	mg/m3	9.0E-01	mg/kg/day				
BENZENE	chronic	3.0E-02	mg/m3	8.6E-03	mg/kg/day	ALIM, Kidney, DEV	90	IRIS	11/30/2006
BENZO(A)ANTHRACENE	chronic	NA	mg/m3	NA	mg/kg/day				
BENZO(A)PYRENE	chronic	NA	mg/m3	NA	mg/kg/day	RESP	300	IRIS	11/30/2006
BENZO(B)FLUORANTHENE	chronic	NA	mg/m3	NA	mg/kg/day				
BIS(2-ETHYLHEXYL)PHTHALATE	chronic	7.0E-02	mg/m3	2.0E-02	mg/kg/day	DEV, ALIM, liver, kidney, endocrine Peripheral necropathy	300	IRIS	11/30/2006
CARBON DISULFIDE	chronic	7.0E-01	mg/m3	2.0E-01	mg/kg/day				
CARBON TETRACHLORIDE	chronic	4.0E-02	mg/m3	1.1E-02	mg/kg/day	CVS, CNS	3000	IRIS	11/30/2006
CHLOROFORM	chronic	3.0E-01	mg/m3	8.6E-02	mg/kg/day				
CHROMIUM	chronic	NA	mg/m3	NA	mg/kg/day	RESP	300	IRIS	11/30/2006
CHROMIUM VI	chronic	8.0E-06	mg/m3	2.3E-06	mg/kg/day				
DICHLORODIFLUOROMETHANE	chronic	2.0E-01	mg/m3	5.7E-02	mg/kg/day	EPA-Region 9	10/01/2004	IRIS	11/30/2006
DIELDRIN	chronic	1.8E-04	mg/m3	5.0E-05	mg/kg/day				
ETHYLBENZENE	chronic	1.0E+00	mg/m3	2.9E-01	mg/kg/day	EPA-Region 9	10/01/2004	IRIS	11/30/2006
HEXANE (N-HEXANE)	chronic	7.0E-01	mg/m3	2.0E-01	mg/kg/day				
IRON	chronic	NA	mg/m3	NA	mg/kg/day	EPA-Region 9	10/01/2004	IRIS	11/30/2006
LEAD	chronic	NA	mg/m3	NA	mg/kg/day				
METHYLENE CHLORIDE	chronic	4.0E-01	mg/m3	1.1E-01	mg/kg/day	EPA-Region 9	10/01/2004	IRIS	11/30/2006
NAPHTHALENE	chronic	3.0E-03	mg/m3	8.5E-04	mg/kg/day				
PCB-1254 (AROCOR 1254)	chronic	7.0E-05	mg/m3	2.0E-05	mg/kg/day	EPA-Region 9	10/01/2004	IRIS	11/30/2006
PHENANTHRENE	chronic	NA	mg/m3	NA	mg/kg/day				
TETRACHLOROETHENE	chronic	3.5E-02	mg/m3	1.0E-02	mg/kg/day	EPA-Region 9	10/01/2004	IRIS	11/30/2006
TETRAHYDROFURAN	chronic	3.0E-01	mg/m3	8.6E-02	mg/kg/day				
TOLUENE	chronic	3.0E-01	mg/m3	8.6E-02	mg/kg/day	CNS, RESP, DEV	10	IRIS	11/30/2006
TRICHLOROETHENE	chronic	6.0E-01	mg/m3	1.7E-01	mg/kg/day				
TRICHLOROFLUOROMETHANE (FREON 11)	chronic	7.0E-01	mg/m3	2.0E-01	mg/kg/day	CNS, eyes	EPA-Region 9	10/01/2004	

Footnotes:

EPA-Region 9: USEPA Region IX Preliminary Remediation Goals Tables  
 IRIS: USEPA Integrated Risk Information System online toxicity database  
 na: No value is available.  
 mg/m3: milligram per cubic meter.  
 mg/kg/day: milligram per kilogram per day.

CNS: Central Nervous system  
 CVS: Cardiovascular system  
 RESP: Respiratory system  
 ALIM: Alimentary system  
 DEV: Developmental

# Section 5

## Risk Characterization

In the final step of risk assessment, exposure estimates are combined with toxicity criteria presented in the toxicity assessment to estimate carcinogenic risks and noncarcinogenic hazards. EPA Risk Assessment Guidance for Superfund (RAGS) calculations are used to evaluate the risks. Lead (Pb) is an exception. Potential health hazards associated with exposure to lead are estimated using the Adult Lead Methodology as discussed in Section 3.

Equations used for risk and hazards calculations are presented below.

### 5.1 Risk Equations

Potential cancer risks and potential non-cancer hazards are separately calculated using standard methods from EPA as described in the following sections.

#### 5.1.1 Cancer Risks

Cancer risks are estimated by multiplying exposure estimates for carcinogenic chemicals by corresponding cancer slope factors. The result is a risk estimate expressed as the incremental odds of developing cancer. Commonly, risks (or odds) of developing cancer of one to 100 in one million ( $1 \times 10^{-6}$  to  $1 \times 10^{-4}$ ) or less are considered to fall within a potentially acceptable range, although decisions on the need for remediation or mitigation are made on a site-by-site basis. Lower risks are typically considered de minimis, while higher risks are often deemed unacceptable (EPA, 1992). In such instances, mitigation of risks may be considered necessary.

Carcinogenic risks are estimated as the incremental probability that an individual will develop cancer over a lifetime as a direct result of exposure to potential carcinogens (EPA, 1989). The estimated risk is expressed as a unitless probability. The equation for calculating the potential excess cancer risk for each carcinogenic chemical is:

$$\text{Risk}_i = \text{CDI}_i \times \text{CSF}_i$$

Where:

$\text{Risk}_i$  = Lifetime Excess Cancer Risk from exposure to chemical<sub>i</sub>

$\text{CDI}_i$  = Chronic Daily Intake for chemical<sub>i</sub> in milligrams per kilograms per day (mg/kg-day)

$\text{CSF}_i$  = Inhalation Cancer Slope Factor (mg/kg-day)<sup>-1</sup>

An estimate of an individual's incremental excess cancer risk from potential exposure to multiple chemicals emitted from the site is then calculated by summing the chemical-specific excess cancer risks (i.e., Total risk =  $\sum \text{Risk}_i$ ).

### 5.1.2 Chronic Non-Cancer Hazards

Chronic non-cancer hazard indices are calculated by dividing exposure estimates by reference doses. As discussed in Section 4, Non-Cancer Reference Doses, reference doses are estimates of highest exposure levels that would not cause adverse health effects even if exposures continue over a lifetime. The ratio of exposure to reference dose is termed the hazard quotient (HQ). A HQ greater than one indicates an exposure greater than that considered safe. Risks or odds of adverse effects cannot be estimated using reference doses. However, because reference doses are developed in a conservative fashion, HQs only slightly higher than one are generally accepted as being associated with low risks (or even no risk) of adverse effects, and that potential for adverse effects increases as the HQ gets larger.

Impacts of exposure to multiple chemicals are accounted for by adding estimated HQs for non-carcinogenic chemicals that affect the same target organ or tissue in the body. Addition of HQs for COPCs that produce effects in similar organs and tissues results in a HI that reflects possible cumulative hazards.

For COPCs that are not classified as carcinogens and for those carcinogens known to cause adverse health effects in addition to cancer, the potential for exposure to result in non-carcinogenic effects is evaluated by comparing estimated daily dose to the chemical-specific non-cancer RfD. The non-cancer RfD represents the average daily exposure concentrations at (or below) which no adverse health effects are anticipated.

When calculated for a single chemical, the comparison yields a ratio termed a hazard quotient. To evaluate the potential for non-carcinogenic adverse health effects from simultaneous exposure to multiple chemicals, hazard quotients for all chemicals that affect the same target organs are summed yielding hazard indices (HI).

Equations for calculating the chemical-specific hazard quotients and the overall hazard index are:

$$HQ_i = \frac{CDI_i}{RfD_i}$$

$$HI = \sum HQ_i$$

Where:

HI = Hazard Index

HQ<sub>i</sub> = Hazard Quotient for individual chemical<sub>i</sub>

CDI<sub>i</sub> = Chronic daily intake for chemical<sub>i</sub> (mg/kg-day)

RfD<sub>i</sub> = Chronic Non-cancer Inhalation Reference Dose for chemical<sub>i</sub> (mg/kg-day)

## 5.2 Risk Characterization Results

Cancer risks and non-cancer hazards for receptors at the Site are summarized in Table 5-1. The risk calculation spreadsheets are provided in Appendix A.

### 5.2.1 Cancer Risks

Total cancer risk estimates for the commercial/industrial worker on the Site parcel (CTE,  $6E-5$  and RME,  $8E-5$ ) are above the point of departure of one in one million but within the EPA risk range. Total cancer risk estimates for the construction worker (CTE,  $2E-6$  and RME,  $5E-6$ ) on the Site parcel are above the point of departure of one in one million but within the lower end of the EPA risk range. Cancer risks for the industrial/commercial worker are primarily attributable to inhalation of indoor air. Construction workers were only assessed for exposure to contaminated soils. The following discussions separately describe risks associated with soil and indoor air exposure in more detail.

#### *Risks Associated With Soil Exposure*

Risks associated with surface soil exposure only account for 2 percent of the total cancer risks for the commercial/industrial worker and are within the lower end of the EPA risk range ( $1E-6$ ). For construction workers, the risks associated with oral and dermal exposure to surface and subsurface soil and inhalation of fugitive dust are also within the lower end of the EPA risk range (CTE,  $2E-6$  and RME,  $4E-6$ ).

Risks associated with surface soil exposure for the commercial/industrial worker are not likely to be realized. In a commercial/industrial setting, most of the surface soil at the site will be covered by buildings, concrete/asphalt driveways, and landscaped grounds. Little bare soil would be available for contact and estimated risks for this pathway are greatly exaggerated.

Risks related to possible exposure to soil and subsurface soil for construction workers are also not likely to be realized. PCE accounts for about 80 percent of the cancer risk for construction workers (both CTE and RME). PCE is highly volatile and will volatilize quickly from soils exposed during excavation. Some initial exposure of construction workers could be possible, but this exposure is unlikely to continue for the full exposure duration.

Although risks associated with possible soil exposure were estimated only for the Omega Site parcel, these risks can serve as upper bound estimates for exposure to soils for the other parcels. Site-related contamination is likely to be highest near source areas at the site, and similar or lower levels of COPCs are anticipated in adjacent properties that were not sampled. Thus, minimal risks from exposure to site-related chemicals in soils are expected in surrounding parcels.

#### *Risks Associated With Indoor Air Exposure*

Potential inhalation of indoor air is the primary contributor to cancer risks (CTE,  $6E-5$  and RME,  $8E-5$ ) for an industrial/commercial worker on the Omega Site parcel. Inhalation of benzene accounts for 40 percent of the cancer risk while inhalation of methylene chloride account for 37 percent of the cancer risk for

commercial/industrial workers. Inhalation of PCE accounts for 15 percent of the risk. Onsite, sources at Star Auto Body and/or 3 Kings Construction could be responsible for some or all of the benzene detected in indoor air. However, available data do not allow differentiation of subsurface and building sources for this parcel.

For the other five parcels, cancer risks were assessed only for the inhalation of vapors intruding into indoor air. Inhalation cancer risks for the other five parcels were either equivalent or below the inhalation risks calculated for the Site parcel. All inhalation cancer risks were above the point of departure of one in one million but within the EPA risk range.

Inhalation cancer risks for the five parcels are summarized as follows. Cancer risks for the north parcel (CTE, 2E-5 and RME, 3E-5) are primarily attributable to exposure to PCE (54 percent) with lesser contributions from carbon tetrachloride (14 percent), benzene (12 percent), and TCE (11 percent). Cancer risks for the west parcel (CTE, 6E-5 and RME, 8E-5) are primarily attributable to exposure to PCE (87 percent) with lesser contributions from carbon tetrachloride (4 percent) and benzene (6 percent). Cancer risks for the south parcel – Bishop (CTE, 2E-5 and RME, 3E-5) are primarily attributable to exposure to PCE (71 percent) with lesser contributions from carbon tetrachloride (10 percent) and benzene (15 percent). Cancer risks for the south parcel – Skateland (CTE, 1E-5 and RME, 2E-5) are primarily attributable to exposure to PCE (84 percent) with a lesser contribution from TCE (16 percent). Cancer risks for the south parcel – LA Carts/Oncology Care (CTE, 1E-5 and RME, 1E-5) are primarily attributable to exposure to benzene (46 percent) with lesser contributions from carbon tetrachloride (18 percent) and chloroform (12 percent).

Benzene and carbon tetrachloride are observed in similar concentrations in ambient air and indoor air for parcels other than the Omegas site itself. Ambient levels of benzene were reported between 0.25 and 0.34 ppbv (0.8 to 1.09  $\mu\text{g}/\text{m}^3$ ), compared to indoor air concentrations for adjacent parcels (0.28 to 0.68 ppbv [0.89 to 2.17  $\mu\text{g}/\text{m}^3$ ], with only one value concentration above 0.39 ppbv [1.25  $\mu\text{g}/\text{m}^3$ ]). Ambient concentrations of carbon tetrachloride ranged from 0.078 to 0.1 ppbv (0.5 to 0.63  $\mu\text{g}/\text{m}^3$ ), compared to indoor air concentrations ranging from 0.079 to 0.13 ppbv (0.5 to 0.82  $\mu\text{g}/\text{m}^3$ ). Further, carbon tetrachloride is reported infrequently in the subsurface (once among 46 shallow soil gas samples: carbon tetrachloride in the subsurface does not appear to represent a significant source. Indoor air concentrations of benzene and carbon tetrachloride may well have their source in ambient air rather than soil vapors. This interpretation is supported by the lack of PCE and other chemicals in indoor air in the LA Carts/Oncology Care buildings. These VOCs are found in very high concentrations along with benzene and carbon tetrachloride in soil gas. One would expect to find these other VOCs along with benzene and carbon tetrachloride in indoor air if subsurface vapors were intruding into buildings.

Chloroform, though detected in soil gas and groundwater, is also common in municipal water as a result of chlorination, and is a common indoor air contaminant. Chloroform concentrations detected in indoor air are relatively low (0.029 to 0.14 ppbv, 0.14 to 0.68  $\mu\text{g}/\text{m}^3$ ) and are certainly consistent with a source in municipal

water. Again, this interpretation is supported by the lack of PCE and other chemicals in indoor air in the LA Carts/Oncology Care buildings. These VOCs are found in very high concentrations along with chloroform in soil gas. One would expect to find these other VOCs along with chloroform in indoor air if subsurface vapors were intruding into buildings. Chloroform was not reported in ambient air samples. Without the contributions of benzene, carbon tetrachloride, and chloroform which could be attributable to background, inhalation cancer risks for the parcels would be as follows:

- North Parcel: CTE, 1E-5 and RME, 2E-5 (compared to CTE, 2E-5 and RME, 3E-5 with benzene, carbon tetrachloride, and chloroform)
- West Parcel: CTE, 5E-5 and RME, 7E-5 (compared to CTE, 6E-5 and RME, 8E-5 with benzene, carbon tetrachloride, and chloroform)
- South Parcel – Bishop: CTE, 1E-5 and RME, 2E-5 compared to (CTE, 2E-5 and RME, 3E-5 with benzene, carbon tetrachloride, and chloroform)
- South Parcel - LA Carts/Oncology Care: CTE, 2E-6 and RME, 3E-6 (compared to CTE, 1E-5 and RME, 1E-5 with benzene, carbon tetrachloride, and chloroform)

The above considerations suggest that background risks, unrelated to vapor intrusion of site-related contaminants is in the range of  $1 \times 10^{-5}$ . Such risks suggest that incremental risks possibly related to site contamination are a significant portion of total risks associated with VOCs in indoor air. Background risks account for essentially all risks at the LA Carts/Oncology Care buildings and 12 to 33 percent of total risks for surrounding parcels.

## 5.2.2 Chronic Non-Cancer Hazards

Total hazard indices for the construction worker (both CTE, 0.1 and RME, 0.3) are less than the target HI of one, indicating that non-cancer hazards at the site are negligible for this receptor. However, the chronic non-cancer hazards for the commercial/industrial worker (2.4 (CTE) and 3.4 (RME)) are above the threshold of 1. HIs for the commercial/industrial worker are primarily attributable to inhalation of indoor air. The following discussions separately describe the hazards associated with soil exposure and indoor air in more detail.

### *Hazards Associated With Soil Exposure*

Hazards associated with surface soil exposure only account for 3 percent of the total HIs for the commercial/industrial worker and below the target threshold of one. For construction workers, the HIs associated with oral and dermal exposure to surface and subsurface soil and inhalation of fugitive dust are below the target threshold of one (CTE, 0.1 and RME, 0.3).

Risks associated with surface soil exposure for the commercial/industrial worker are not likely to be realized. In a commercial/industrial setting, most of the surface soil at the site will be covered by buildings, concrete/asphalt driveways, and landscaped

grounds. Little bare soil would be available for contact and estimated risks for this pathway are greatly exaggerated.

Noncancer hazards related to possible exposure to soil and subsurface soil for construction workers are not likely to be realized. These risks are due primarily to potential exposure to TCE (49 percent). TCE is highly volatile and will volatilize quickly from soils exposed during excavation. Some initial exposure of construction workers could be possible, but this exposure is unlikely to continue for the full exposure duration.

In addition, risks estimated for the Omega site for possible exposure to soils can serve as upper bound estimates for exposure to soils for the other parcels. Site-related contamination is likely to be highest near source areas at the site, and similar or lower levels of COPCs are anticipated in surrounding parcels that were not sampled. Thus, minimal risks from exposure to site-related chemicals in soils are expected in surrounding parcels.

#### *Hazards Associated With Indoor Air Exposure*

The highest HQs for the Site parcel are attributable to inhalation exposure to toluene and acetone, which account for 63 and 18 percent of site-related HIs for the commercial/industrial worker, respectively. When the total HI is divided by target organ, HI associated with kidneys is the largest portion (82 percent of the total HI, or an HI of 1.9, CTE and 2.8, RME). HIs for all other organs are less than the threshold of 1. For the other five parcels, HIs were assessed only for the inhalation of vapors intruding into indoor air. Inhalation HIs for the other five parcels were all below the HIs for the site parcel and less than or equivalent to the target HI of one, indicating that non-cancer hazards at these parcels are minimal.

Inhalation HIs for the five parcels are summarized as follows. HIs for the north parcel (CTE, 0.4 and RME, 0.6) are primarily attributable to exposure to acetone (57 percent) with a lesser contribution from PCE (34 percent). HIs for the west parcel (CTE, 0.7 and RME, 1.0) are primarily attributable to exposure to PCE (93 percent). HIs for the south parcel - Bishop (CTE, 0.2 and RME, 0.3) are primarily attributable to exposure to PCE (83 percent) with a lesser contribution from 1,1-DCE (7 percent). HIs for the south parcel - LA Carts/Oncology Care (CTE, 0.6 and RME, 0.8) are primarily attributable to exposure to toluene (76 percent) with a lesser contribution from acetone (15 percent). HIs for the south parcel - Skateland (CTE, 0.4 and RME, 0.6) are primarily attributable to exposure to 1,1-DCE (60 percent) with a lesser contribution from PCE (27 percent).

### **5.2.3 Risks Associated with Lead Exposure**

Ingestion of soil by the commercial/industrial worker would likely be incidental from hand to mouth activities. The EPA Adult Lead Methodology was used to assess exposure to lead. The lead model was adjusted for the exposure frequency discussed in Section 3 and the 95% UCL for lead detected in surface soil (44.4 mg/kg).

The model results indicate that the geometric mean blood lead concentration might range from 1.6 to 1.8  $\mu\text{g}/\text{dl}$  for an adult worker. The 95<sup>th</sup> percentile blood lead concentration of a fetus in an adult worker would range from 5.0 to 6.5  $\mu\text{g}/\text{dl}$ . This range is considerably below a typical target of 10  $\mu\text{g}/\text{dL}$ . More importantly, the probability that fetal blood levels for pregnant adult worker would exceed the target of 10  $\mu\text{g}/\text{dL}$  is 0.5% to 1.6%. Where the probability of exceeding 10  $\mu\text{g}/\text{dL}$  is 5 percent or less, lead exposures are typically deemed to fall into an acceptable range. Therefore, risks due to lead exposure do not appear to be sufficiently high to warrant action.

### 5.3 Health Based Risk Goals (HBRGs)

Health based risk goals (HBRGs) can be used as guidelines to screen chemical concentrations in media for potential risks. HBRGs conform to EPA Risk Assessment Guidance for Superfund Volume 1, Part B (1991a). They do not automatically represent remediation levels nor do they establish that cleanup action to meet these HBRGs is warranted (EPA 1991). Remediation levels to be used in cleanup activities are selected by the remedial project manager (RPM) following review of site-specific and other considerations, such as availability of data, regional information, uncertainties, and future site use. Action levels may reasonably be selected from the ranges of HBRGs presented in this report.

HBRGs are developed for carcinogenic and noncarcinogenic risks for commercial land use and RME and CTE exposure scenarios. HBRGs were calculated only for those COPCs for soil and indoor air that had individual cancer risks above  $10^{-7}$  or a hazard above 0.1. These COPCs are likely most important for risk management. By determining acceptable risk (i.e.,  $1\text{E}-06$  cancer risk) and combining this with exposure assumptions, it is possible to calculate the average media concentration that results in the selected target risk. This medium concentration, which represents the average concentration across the exposure unit, is the health risk-based goal. HBRG equations combine intakes from the exposure pathways being evaluated, and thus the resulting HBRGs should be protective for total exposures from those pathways.

To calculate HBRGs, target cancer risks or HIs are input to the equations for back calculation to a media concentration. HBRGs are basically the reverse of risk assessment calculations. These calculations use a selected acceptable risk (i.e., a cancer risk of one in one million and a hazard index of 1), exposure variables, and chemical toxicity factors to determine the medium-specific chemical concentration resulting in the selected risk. Media of concern, COPCs, receptor populations, potential exposure pathways and exposure assumptions for receptors were defined in Section 3. HBRGs calculated for the site are summarized in Table 5-2 with full calculations provided in Appendix A.

Exposure assumptions and calculations did not vary among parcels, thus HBRGs for indoor air are applicable for all buildings at the site currently, and for any future buildings that may be constructed. Likewise, although soil data were limited to the Omega site and its boundaries, exposure assumptions and calculations would be the same for surrounding parcels. Thus, HBRGs for soil are also applicable to all parcels.

However, risks and hazards potential associated with direct contact with surface soils are based on assumed exposure to volatile chemicals by commercial/industrial workers. Volatile chemicals will not remain in surface soils for chronic exposure durations, and risks and hazards presented for VOCs in this report are artificially high.

**Table 5-1  
Summary of Chronic Cancer Risks and Chronic Non-Cancer Hazards**

Receptor	Exposure Pathway	PARCEL Site		PARCEL North		PARCEL West		PARCEL South - Bishop		PARCEL South - LA Carts/Oncology Care		PARCEL South - Skateland <sup>(1)</sup>	
		Total Chronic Cancer Risk <sup>(3)</sup>	Total Chronic Non-Cancer Hazard <sup>(3)</sup>	Total Chronic Cancer Risk <sup>(3)</sup>	Total Chronic Non-Cancer Hazard <sup>(3)</sup>	Total Chronic Cancer Risk <sup>(3)</sup>	Total Chronic Non-Cancer Hazard <sup>(3)</sup>	Total Chronic Cancer Risk <sup>(3)</sup>	Total Chronic Non-Cancer Hazard <sup>(3)</sup>	Total Chronic Cancer Risk <sup>(3)</sup>	Total Chronic Non-Cancer Hazard <sup>(3)</sup>	Total Chronic Cancer Risk <sup>(3)</sup>	Total Chronic Non-Cancer Hazard <sup>(3)</sup>
Commercial/Industrial worker CTE	Soil – Oral/Dermal	1.E-06	0.1	NA <sup>(2)</sup>	NA <sup>(2)</sup>	NA <sup>(2)</sup>	NA <sup>(2)</sup>	NA <sup>(2)</sup>	NA <sup>(2)</sup>	NA(2)	NA(2)	NA <sup>(2)</sup>	NA <sup>(2)</sup>
	Indoor Air – Inhalation Pathway <sup>(1)</sup>	6.E-05	2.3	2.E-05 (1.E-05)	0.4	6.E-05 (5.E-05)	0.7	2.E-05 (1.E-05)	0.2	1.E-05 (2.E-06)	0.6	1.E-05	0.4
	<b>TOTAL</b>	<b>6.E-05</b>	<b>2.4</b>	<b>2.E-05</b>	<b>0.4</b>	<b>6.E-05</b>	<b>0.7</b>	<b>2.E-05</b>	<b>0.2</b>	<b>1.E-05</b>	<b>0.6</b>	<b>1.E-05</b>	<b>0.4</b>
Commercial/Industrial worker RME	Soil – Oral/Dermal	1.E-06	0.1	NA <sup>(2)</sup>	NA <sup>(2)</sup>	NA <sup>(2)</sup>	NA <sup>(2)</sup>	NA <sup>(2)</sup>	NA <sup>(2)</sup>	NA(2)	NA(2)	NA <sup>(2)</sup>	NA <sup>(2)</sup>
	Indoor Air – Inhalation Pathway <sup>(1)</sup>	8.E-05	2.3	3.E-05 (2.E-05)	0.6	8.E-05 (7.E-05)	1.0	3.E-05 (2.E-05)	0.3	1.E-05 (3.E-06)	0.8	2.E-05	0.6
	<b>TOTAL</b>	<b>8.E-05</b>	<b>3.4</b>	<b>3.E-05</b>	<b>0.6</b>	<b>8.E-05</b>	<b>1.0</b>	<b>3.E-05</b>	<b>0.3</b>	<b>1.E-05</b>	<b>0.8</b>	<b>2.E-05</b>	<b>0.6</b>
Construction Worker CTE	Soil – Oral/Dermal, Inhalation of Fugitive Dust	<b>2.E-06</b>	<b>0.1</b>	NA <sup>(2)</sup>	NA <sup>(2)</sup>	NA <sup>(2)</sup>	NA <sup>(2)</sup>	NA <sup>(2)</sup>	NA <sup>(2)</sup>	NA(2)	NA(2)	NA <sup>(2)</sup>	NA <sup>(2)</sup>
Construction Worker RME	Soil – Oral /Dermal, Inhalation of Fugitive Dust	<b>4.E-06</b>	<b>0.3</b>	NA <sup>(2)</sup>	NA <sup>(2)</sup>	NA <sup>(2)</sup>	NA <sup>(2)</sup>	NA <sup>(2)</sup>	NA <sup>(2)</sup>	NA(2)	NA(2)	NA <sup>(2)</sup>	NA <sup>(2)</sup>

(1) Indoor air pathway for Skateland was calculated using measured soil gas data instead of indoor air data because existing building is soon to be demolished and measured indoor air values are thus irrelevant.

(2) Soil pathways not calculated separately for the parcels

(3) Values in parentheses indicate risks without the contributions of benzene, carbon tetrachloride, and chloroform, which could be attributable to background.

**Table 5-2  
Summary of Carcinogenic and Non-Carcinogenic HBRGs for COPCs  
Omega Chemical Site - Whittier, California**

Scenario Timeframe:	Current/Future
Receptor Population:	Industrial Worker and Construction Worker
Receptor:	Adult

Target Risk            1.0E-06  
Target Hazard        2.0E-01

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	HBRG for Exposure Point					HBRG For Original Medium		Comparison of Calculated HBRG to Existing Screening Level <sup>(1)</sup>	
				Industrial CTE	Industrial RME	Construction CTE	Construction RME	Receptor Minimum	Value	Units	Screening Level	Notes
Soil	Soil	Soil	BENZO(A)PYRENE	NA	NA	1.4E+01	5.2E+00	5.2E+00	5.2E+00	mg/kg	2.11E-01	OK
			BIS(2-ETHYLHEXYL)PHTHALATE	3.1E+02	3.1E+02	NA	NA	3.1E+02	3.1E+02	mg/kg	1.23E+02	OK
			DIELDRIN	NA	3.6E-01	NA	NA	3.6E-01	3.6E-01	mg/kg	1.08E-01	OK
			LEAD	NA	6.7E+02	NA	NA	6.7E+02	6.7E+02	mg/kg	8.00E+02	PRG less stringent
			NAPHTHALENE	NA	2.4E+01	NA	NA	2.4E+01	2.4E+01	mg/kg	4.20E+01	OK
			PCB-1254 (AROCOR 1254)	5.8E-01	5.8E-01	NA	NA	5.8E-01	5.8E-01	mg/kg	7.44E-01	PRG less stringent
			TETRACHLOROETHENE	NA	NA	4.5E+02	1.2E+02	1.2E+02	1.2E+02	mg/kg	1.31E+00	OK
TRICHLOROETHENE	NA	NA	NA	2.7E+02	2.7E+02	2.7E+02	mg/kg	6.47E+00	OK			
Indoor Air	Indoor Air	Indoor Air	1,1-DICHLOROETHENE	6.1E+02	6.1E+02	NA	NA	6.1E+02	6.1E+02	ug/m <sup>3</sup>	---	No CHHSL
			1,2-DICHLOROETHANE	3.3E-01	3.3E-01	NA	NA	3.3E-01	3.3E-01	ug/m <sup>3</sup>	1.95E-01	OK
			1,4-DICHLOROBENZENE	7.5E-01	7.5E-01	NA	NA	7.5E-01	7.5E-01	ug/m <sup>3</sup>	---	No CHHSL
			ACETONE	9.6E+03	9.6E+03	NA	NA	9.6E+03	9.6E+03	ug/m <sup>3</sup>	---	No CHHSL
			BENZENE	3.0E-01	3.0E-01	NA	NA	3.0E-01	3.0E-01	ug/m <sup>3</sup>	1.41E-01	OK
			CARBON TETRACHLORIDE	2.0E-01	2.0E-01	NA	NA	2.0E-01	2.0E-01	ug/m <sup>3</sup>	9.73E-02	OK
			CHLOROFORM	3.7E-01	3.7E-01	NA	NA	3.7E-01	3.7E-01	ug/m <sup>3</sup>	---	No CHHSL
			METHYLENE CHLORIDE	8.5E+00	8.5E+00	NA	NA	8.5E+00	8.5E+00	ug/m <sup>3</sup>	---	No CHHSL
			TETRACHLOROETHENE	1.4E+00	1.4E+00	NA	NA	1.4E+00	1.4E+00	ug/m <sup>3</sup>	6.93E-01	OK
			TOLUENE	9.1E+02	9.1E+02	NA	NA	9.1E+02	9.1E+02	ug/m <sup>3</sup>	4.38E+02	OK
TRICHLOROETHENE	4.3E+00	4.3E+00	NA	NA	4.3E+00	4.3E+00	ug/m <sup>3</sup>	2.04E+00	OK			

NA: Not applicable, not a COPC for the pathway or the receptor scenario  
 OK: indicates that HBRG is higher than screening level  
 HBRG: Health based risk goal  
 CHHSL: California Human Health Screening Level  
 PRG: Preliminary Remediation Goal  
 ug/m<sup>3</sup>: microgram per cubic meter  
 mg/kg: milligram per kilogram

(1) Screening Levels were as follows:  
 Indoor air screening levels are CalEPA CHHSLs Indoor Air Screening Levels for Human Health Commercial/Industrial Use (EPA 2005).  
 Soil screening levels are EPA's Region 9 Preliminary Remediation Goals (PRGs) for industrial soil (EPA 2004c)

**Table 5-3  
Comparison of Carcinogenic and Non-Carcinogenic HBRGs for COPCs to Parcel Maximum Detections  
Omega Chemical Site - Whittier, California**

Scenario Timeframe:	Current/Future
Receptor Population:	Industrial Worker and Construction Worker
Receptor:	Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	HBRG		Maximum Detections by Parcel <sup>1</sup>				
				For Original Medium		Site Parcel	North Parcel	West Parcel	South Parcel Bishop	South Parcel LA Carts/Oncology Care
				Value	Units					
Soil	Soil	Soil	BENZO(A)PYRENE	5.2E+00	mg/kg	1.6E+00	NA	NA	NA	NA
			BIS(2-ETHYLHEXYL)PHTHALATE	3.1E+02	mg/kg	5.1E+01	NA	NA	NA	NA
			DIELDRIN	3.6E-01	mg/kg	5.0E-02	NA	NA	NA	NA
			LEAD	6.7E+02	mg/kg	<b>8.9E+02</b>	NA	NA	NA	NA
			NAPHTHALENE	2.4E+01	mg/kg	1.2E+00	NA	NA	NA	NA
			PCB-1254 (AROCLO 1254)	5.8E-01	mg/kg	5.0E-01	NA	NA	NA	NA
			TETRACHLOROETHENE	1.2E+02	mg/kg	<b>1.3E+03</b>	NA	NA	NA	NA
TRICHLOROETHENE	2.7E+02	mg/kg	1.4E+02	NA	NA	NA	NA			
Indoor Air	Indoor Air	Indoor Air	1,1-DICHLOROETHENE	6.1E+02	ug/m <sup>3</sup>	1.7E+01	1.0E+01	2.3E+01	1.4E+01	3.7E+00
			1,2-DICHLOROETHANE	3.3E-01	ug/m <sup>3</sup>	NA	NA	NA	NA	3.2E-01
			1,4-DICHLOROBENZENE	7.5E-01	ug/m <sup>3</sup>	NA	<b>9.0E-01</b>	3.0E-01	3.2E-01	3.9E-01
			ACETONE	9.6E+03	ug/m <sup>3</sup>	5.9E+03	3.3E+03	4.3E+01	4.1E+01	1.2E+03
			BENZENE	3.0E-01	ug/m <sup>3</sup>	<b>1.1E+01</b>	<b>1.1E+00</b>	<b>1.4E+00</b>	<b>1.3E+00</b>	<b>2.2E+00</b>
			CARBON TETRACHLORIDE	2.0E-01	ug/m <sup>3</sup>	<b>6.9E-01</b>	<b>8.2E-01</b>	<b>6.9E-01</b>	<b>5.7E-01</b>	<b>5.2E-01</b>
			CHLOROFORM	3.7E-01	ug/m <sup>3</sup>	2.4E-01	3.4E-01	2.4E-01	1.8E-01	<b>6.8E-01</b>
			METHYLENE CHLORIDE	8.5E+00	ug/m <sup>3</sup>	<b>2.6E+02</b>	4.9E+00	1.5E+00	1.7E+00	5.9E+00
			TETRACHLOROETHENE	1.4E+00	ug/m <sup>3</sup>	<b>3.5E+01</b>	<b>2.2E+01</b>	<b>1.0E+02</b>	<b>2.9E+01</b>	<b>1.6E+00</b>
			TOLUENE	9.1E+02	ug/m <sup>3</sup>	<b>2.3E+03</b>	NA	NA	NA	5.7E+02
TRICHLOROETHENE	4.3E+00	ug/m <sup>3</sup>	<b>6.5E+00</b>	<b>1.3E+01</b>	<b>4.3E+00</b>	NA	NA			

NA: Not applicable

HBRG: Health based risk goal

ug/m<sup>3</sup>: microgram per cubic meter

mg/kg: milligram per kilogram

Values in **Bold** exceed their corresponding HBRG

1: Maximum detections shown for soil are for 0-30 feet bgs

## Section 6

# Uncertainties

### 6.1 Uncertainties in the Risk Assessment Process

A degree of uncertainty is associated with all phases of a risk assessment. This section describes the potential impact of uncertainties associated with the database, exposure assumptions, and toxicity assessment on the final step of the risk assessment and risk characterization. In addition, uncertainties inherent in risk characterization are identified and discussed.

### 6.2 Uncertainties in the Database

Site data appear to provide an adequate characterization of current conditions at the site. Numerous samples were collected across the site for all media, and in many cases sampling locations were biased towards contaminated (or formerly contaminated) areas. That is, much of the site characterization effort focused on and near known source/release areas. Moreover, more than one round of sampling was completed for each media, reducing any concerns with taking a "snap shot" of site conditions that was not representative of typical conditions. This concern is particularly relevant to soil gas and indoor air concentrations which could theoretically vary considerably over time.

COPCs for groundwater, soil, soil gas, and indoor air at the Site were selected based on a screening analysis of each chemical's potential to contribute to Site-related risks. Chemicals are screened by comparing maximum detected concentrations in site media with risk-based screening concentrations, "allowable" media concentrations based on generic exposure assumptions available from EPA (Region IX PRGs, CalEPA CHHSLs, and USEPA groundwater target concentrations for indoor air). To make this selection process more conservative, only one-tenth of the PRGs and groundwater target concentrations were used for the screening to allow for the additive effects of multiple chemicals. Since the list of chemicals with CHHSLs is short, this additional conservatism was not utilized for soil gas and indoor air samples.

Overall, available data for the site can be considered representative, or somewhat biased toward areas of contamination. COPC selection based on these data is likely to include chemicals that present little risk rather than exclude chemicals that may be of concern. Risk assessment based on available data can be used with confidence to produce a conservative (protective) evaluation of potential human health risks.

### 6.3 Uncertainties with Exposure Assessment

Methods used in this risk assessment are conservative; methods are used that are more likely to overestimate than underestimate possible health risks. For example, risks and hazards are calculated for individuals that are likely to be exposed at locations where COPC concentrations are predicted to be highest. Further, individuals are assumed to be exposed for almost all days of the year and for many years to maximize estimates of possible exposure. Resulting cancer risk estimates represent

upper-range predictions of exposure, and therefore health risk, which may be associated with living or working on the site. By protecting hypothetical individuals that receive the highest exposures (i.e., people living at or working at locations for which the highest emissions are predicted), the risk assessment will also be protective for actual members of the population that are not as highly exposed.

Potential risks and hazards associated with vapor intrusion were considered on a parcel-by-parcel basis, using data from indoor air sampling for existing buildings. These estimates allow better visualization of potential site-impacts at the Omega Site and at surrounding properties, as well as providing an indication of possible current Site-related health risk, if any. This approach eliminates the possibility that combining data within a larger exposure area (e.g. the Omega Site and all surrounding parcels) dilute out parcels with high and low potential for vapor intrusion.

### 6.3.1 Exposure Concentrations

The site is relatively small and will likely remain as single parcel; therefore, it was appropriately assessed as a single exposure unit. The same argument holds true for surrounding properties that are also relatively small and likely to remain as single parcels. Thus, separate evaluation of vapor intrusion for these parcels is also justified. Exposure point concentrations for individual is, however, subject to some uncertainty because dividing Site data by parcel reduces the size of the datasets used for EPC calculations.

Generally, 95% UCL concentrations were used as the exposure concentrations for site media. A 95% UCL is a statistic meaning that there is a 95% confidence (probability) that the concentration on the site will be at this level. For samples with non-detectable levels of a contaminant, one-half of the reporting limit is substituted when calculating the 95% UCL.

For example, PCE in indoor air is the primary COPC of concern at the site. The 95% UCL for PCE in indoor air for the Site parcel is  $14.2 \mu\text{g}/\text{m}^3$  (2.1 ppbv) while PCE concentrations detected in the 8 indoor air samples ranged from 1.0 to  $34.6 \mu\text{g}/\text{m}^3$  (0.15 to 5.1 ppbv). Only 2 of the 7 PCE detections had concentrations higher than  $14.2 \mu\text{g}/\text{m}^3$  (2.1 ppbv). It is unlikely that a receptor would spend all of his time (in the case of a commercial/industrial worker – 8 hours a day, 250 days a year for 25 years) standing at the location of the highest PCE detection. In such a manner, use of the 95% UCL as the exposure concentration provides a reasonable estimate of exposure.

In some cases, however, small datasets forced the use of the maximum detected concentration in indoor air as the EPC. Use of the maximum is likely overestimate possible indoor air concentrations. In these cases, additional conservatism may be included in risk and hazard estimates.

For a conservative estimate of potential health risks from soil gas for the former Skateland parcel, samples collected from the surface to 6 feet bgs collected from 2004 to 2006 were used to calculate the exposure concentrations for soil gas. Soil gas concentrations can vary seasonally and the availability of multiple rounds of soil gas sampling increased confidence in exposure point concentrations. Higher concentrations of some COPCs were found at greater depths bgs, but available data provide no indication that the observed vertical profile of soil gas concentrations is not representative of typical conditions at the site. That is, the profile did not change notably between sampling events. Thus, higher concentrations found below 6 feet bgs do not suggest that current modeling for vapor intrusion significantly underestimates potential risks or hazards.

### **6.3.2 Exposure Pathways**

Risks and hazards calculated for future commercial/industrial worker soil exposure pathways assume that soil is available for contact. However, the site is currently covered by buildings and other impervious surfaces, and it is unlikely that soils would remain uncovered (i.e., bare) following redevelopment, eliminating much potential for exposure to Site soils. Therefore, risks and hazards associated with the exposure pathways of dermal contact, soil ingestion, and inhalation of particulates are ceiling estimates, and actual risks are likely to be negligible.

### **6.3.3 Estimates of Indoor Air Concentrations**

Indoor air concentrations for the site were estimated directly from measured indoor air concentrations, except for the former Skateland parcel as discussed above. Indoor air concentrations are likely to vary during the course of a day and seasonally, and may be influenced by sources of VOCs inside of buildings and, conceivably, in ambient air. Variations in concentrations over the course of a day were addressed in the sampling by continuous sample collection over an 8-hour period, during typical work hours. These samples provide an overall daily average concentration, which is most appropriate for assessing chronic daily exposure. In addition, samples were taken in various work areas within each building to help ensure that vagaries of building ventilation did not produce spurious results. Thus, available data are reasonable estimates of daily exposure on sample collection days.

Seasonal variation was addressed by collecting samples on two or more occasions. Results from these separate sampling events were very similar for a given building. It is likely that available data reasonably describe likely indoor air quality for each of the buildings sampled. Risks estimated on the basis of measured indoor air concentrations probably fall into upper range of those possible for the site and surrounding parcels.

A final issue concerning indoor air measurements is that they cannot be used directly to estimate future indoor air concentrations should the site and/or surrounding parcels be redeveloped. While it is not possible to predict future indoor air concentrations, it is reasonable to assume that new buildings would be constructed following existing commercial building codes which are likely to require a vapor barrier and substantial ventilation. Moreover, new buildings would have intact

buildings with few if any cracks that would facilitate vapor intrusion. Thus, vapor intrusion can be predicted to be less for new construction than is suggested by current indoor air data. Also, current indoor air data are likely to include non-site-related VOCs from building and/or ambient air. Current data therefore are likely to overestimate site-related risk and hazards, and probably are even more conservative estimates of possible future indoor air concentrations. Risk estimates developed in this document can be used as conservative estimates for future vapor intrusion.

## 6.4 Uncertainties Associated with Toxicity Assessment

A potentially large source of uncertainty is inherent in the derivation of the EPA toxicity criteria (i.e., RfDs, and cancer slope factors). In many cases, data must be extrapolated from animals to sensitive humans by the application of uncertainty factors to an estimated NOAEL or LOAEL for non-cancer effects. While designed to be protective, it is likely in many cases that uncertainty factors overestimate the magnitude of differences that may exist between human and animals, and among humans.

In some cases, however, toxicity criteria may be based on studies that did not detect the most sensitive adverse effects. For example, many past studies have not measured possible toxic effects on the immune system. Moreover, some chemicals may cause subtle effects not easily recognized in animal studies. The effects of lead on cognitive function and behavior at very low levels of exposure serve as examples.

In addition, derivation of cancer slope factors often involves linear extrapolation of effects at high doses to potential effects at lower doses commonly seen in environmental exposure settings. Currently, it is not known whether linear extrapolation is appropriate. In all likelihood, the shape of the dose response curve for carcinogenesis varies with different chemicals and mechanisms of action. It is not possible at this time, however, to describe such differences in quantitative terms.

It is likely that the assumption of linearity is conservative and yields slope factors that are unlikely to lead to underestimation of risks. Yet, for specific chemicals, current methodology could cause slope factors, and, hence, risks, to be underestimated.

Use of CalEPA toxicity criteria could either over or underestimate potential risks, but it is difficult to determine either the direction or magnitude of any errors. In general, however, it is likely that the criteria err on the side of protectiveness for most chemicals.

## 6.5 Uncertainties in Risk Characterization

The current and future land use of the site was assumed to be commercial/industrial. The possibility that this site would be redeveloped for residential use is remote. Its location, surrounded by commercial/residential businesses and next to a major

arterial, make it undesirable and unlikely for residential development. Thus, the assumption of a commercial/industrial land use is reasonable and appropriate.

Also if the site were redeveloped, with the construction of new commercial/industrial facilities, the foundation of the new facilities would be new and would likely not have significant cracks (as assumed in the indoor vapor intrusion model) that would allow easy passage of soil vapors.

The risk assessment assumes that current concentrations of COPCs will remain constant into the future. Data are not available, however, to verify the appropriateness of this assumption. However, risk calculations for indoor air (which appears to be the primary pathway of concern) were based on data collected from 2004 to 2006. A review of the PCE indoor air data collected during this time period (provided in Table 6-1) shows a general decreasing trend of PCE concentrations. As such, it is likely that the risks calculated in this assessment provide an overestimate of future risks as PCE concentrations may decrease in the future. Uncertainties associated with future concentrations need to be taken into account whenever the risk estimates provided in this assessment are used in risk management decisions. They are considered equally important as the numerical estimates in providing a characterization of risk at the site.

Finally, risks and hazards calculated for exposures to construction workers to COPCs in surface soil are artificially high. They are based on VOCs that will remain in surface soil only for short periods. Risks and hazards associated with direct contact with surface soil appear to be minimal.

**Table 6-1**  
**Summary of PCE Indoor Air Data for 2004-2006**  
**Omega Chemical Site - Whittier, California**

SAMPLE ID	SAMPLE DATE	SAMPLE TYPE	TETRACHLOROETHENE (ppbv)
OC-AA-FS-02-051104	5/11/2004	ORIG	145
OC-AA-FS-01-051104	5/11/2004	ORIG	140
OC1-LC1-G-0-11	5/11/2004	EPA	130
OC-AA-FS-05-051104	5/11/2004	ORIG	15
OC-AA-FS-06-051104	5/11/2004	ORIG	14
OC-AA-FS-07-051104	5/11/2004	ORIG	2.35
OC-AA-FS-11-051104	5/11/2004	ORIG	0.89
OC-AA-FS-09-051104	5/11/2004	ORIG	0.87
OC-AA-FS-10-051104	5/11/2004	ORIG	0.62
OC-AA-FS-13-051104	5/11/2004	ORIG	0.46
OC-AA-FS-14-051104	5/11/2004	ORIG	0.15
OC1-RC1-G-0-14	7/30/2004	EPA	24
OC1-CSR-G-0-15	7/30/2004	EPA	21.85
OC1-CSR-G-0-18	7/31/2004	EPA	85
OC1-RC1-G-0-20	7/31/2004	EPA	80
OC-IA-FS-20-080404	8/4/2004	ORIG	110
OC-IA-FS-16-080404	8/4/2004	ORIG	45
OC-IA-FS-18-080404	8/4/2004	ORIG	40
OC-IA-FS-21-080404	8/4/2004	ORIG	26
OC-IA-FS-22-080404	8/4/2004	ORIG	24
OC-IA-FS-23-080404	8/4/2004	ORIG	23
OC-IA-FS-19-080404	8/4/2004	ORIG	1.4
OC1-CSR-G-0-34	12/29/2004	EPA	14
OC1-RC1-G-0-32	12/29/2004	EPA	13
OC1-OFF-G-0-33	12/29/2004	EPA	4.3
OC-IA-FS-03-122904	12/30/2004	ORIG	12
OC-IA-FS-04-122904	12/30/2004	ORIG	12
OC-IA-FS-01-122904	12/30/2004	ORIG	11
OC-IA-FS-02-122904	12/30/2004	ORIG	9.6
OCI-OFF-G-0-38	1/12/2005	EPA	ND
OCI-CSR-G-0-36	1/12/2005	EPA	13
OC-IA-FS-04-011205	1/12/2005	ORIG	8.3
OC-IA-FS-03-011205	1/12/2005	ORIG	6.4
OC-IA-FS-02-011205	1/12/2005	ORIG	6.3
OC-IA-FS-01-011205	1/12/2005	ORIG	5.2
OCI-RCI-G-0-37	1/12/2005	EPA	5.1
OC-AA-FS-02-091405	9/14/2005	ORIG	12.5
OC-AA-FS-17-091405	9/14/2005	ORIG	12
OC-AA-FS-18-091405	9/14/2005	ORIG	10
OC-AA-FS-16-091405	9/14/2005	ORIG	8.7
OC-IA-FD-06-091405	9/14/2005	ORIG	6.6
OC-IA-FD-05-091405	9/14/2005	ORIG	5.7
OC-IA-FS-07-091405	9/14/2005	ORIG	5
OC-AA-FS-10-091405	9/14/2005	ORIG	3.3
OC-IA-FS-14-091405	9/14/2005	ORIG	1.9
OC-IA-FS-13-091405	9/14/2005	ORIG	1.1
OC-AA-FS-11-091405	9/14/2005	ORIG	0.69
OC-IA-FD-09-091405	9/14/2005	ORIG	ND
OC-IA-LAC-Sm Prod-090806	9/8/2006	ORIG	ND
OC-IA-BIS-STORE-090806	9/8/2006	ORIG	4.3
OC-IA-BIS-AO-090806	9/8/2006	ORIG	1.5
OC-IA-BIS-WHSE-090806	9/8/2006	ORIG	1
OC-IA-LAC-Lg Prod-090806	9/8/2006	ORIG	0.24
OC-IA-ONC-NS-090806	9/8/2006	ORIG	0.065
OC-IA-LAC-AO-090806	9/8/2006	ORIG	0.036
OC-IA-MN-090806	9/8/2006	ORIG	ND
OC-IA-ONC-AO-090806	9/8/2006	ORIG	ND

ppbv - parts per billion by volume

# Section 7

## Summary and Conclusions

The primary findings and conclusions of this risk assessment are briefly summarized in this section. The following tasks were performed as part of this risk assessment:

- Examined the history of the Omega Chemical site in Whittier, CA, and identified types of chemicals used and likely release mechanisms for these chemicals to enter the environment
- Evaluated data collected to characterize the site and existing contamination and used the most recent of these data to select chemicals of potential concern (COPCs) and to calculate exposure point concentrations
- Analyzed the potential for exposure to COPCs at the site through an evaluation of people that might be exposed, exposure pathways that might result in significant contact between these people and COPCs, and identification of exposure parameters appropriate for quantifying exposure resulting from this contact.
- Identified appropriate toxicity criteria for site COPCs
- Estimated risk to current and potential future receptors (people) that might contact contamination
- Evaluated uncertainties in data, exposure, toxicity and risk characterization aspects of the risk assessment
- Calculated health-based remediation goals (HBRGs) for use in remediation decisions for the site

Important results of the risk assessment that follow from the above assessments can be summarized as follows:

- Field investigations since 2004 provide a recent and complete site characterization. High confidence can be assigned to use of these data to select chemicals of potential concern and to estimate exposure point concentrations.
- Commercial/industrial land use is an appropriate assumption for future site use. The site has been used for such purpose since it was developed from agricultural land in the 1950's. The site is still surrounded by commercial industrial land use, is located on a major arterial, and possesses no characteristics that would suggest that would make it desirable for residential development.
- Among receptors likely to be exposed to site-related contaminants, the highest cancer risks and noncancer hazards are associated with exposure of current or potential future commercial/industrial workers.

- The pathway that suggests the highest potential for exposure involves intrusion of vapors into indoor air spaces. Inhalation of these vapors in workspaces results in the highest estimates of potential cancer risk and noncancer hazard.
- No complete exposure pathways exists that involves contact with contaminants in soils and groundwater below the 30-foot clay zone.
- PCE is the primary COPC of concern at the site. For example, inhalation of indoor air suggests potential total inhalation cancer risks ranging from 1E-05 to 8E-05. Cancer risk associated with inhalation exposure to PCE alone ranges from 1E-06 to 7E-05. Estimated hazards for PCE were relatively low, however. HQs for exposure to indoor air for PCE ranged from 0.01 to 1 compared to a total inhalation HIs ranging from 0.2 to 3.3.
- Potential risks associated with exposure to ambient (urban background) concentrations of VOCs are as high as  $1 \times 10^{-5}$  and may account for 12 to essentially 100 percent of total risks estimated for indoor exposures, depending on parcel. LA Carts/Oncology Care may not be affected by site-related VOCs. Incremental risks that could be associated with vapor intrusion are significantly less than those presented for total risks at the site..
- Hypothetical exposure to contaminants in soil is unlikely to occur, since soil in currently covered with buildings asphalt and concrete and such cover is likely to remain even if the site is redeveloped for other commercial/industrial purposes in the future. Further, volatile COPCs, in particular PCE, acetone and toluene, will not persist in soils exposed during excavation, and construction worker exposures are expected to be minimal. These VOCs were associated with the bulk of risks and hazards estimated for direct contact exposure to surface soils.
- Uncertainties in the risk assessment suggest that site-related risks have been adequately characterized to support risk management decisions. In fact, the database is biased toward source/release areas and likely overstates levels of contamination for the site as a whole.
- Site-related risks involving exposure to PCE vapors in indoor air appear to be adequately assessed using available site-specific data. All risks fall within EPA's risk range. .
- HBRGs for PCE can be used with confidence in evaluating remedial alternatives, if the site is deemed to pose an unacceptable risk.

# Section 8

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# Appendix A

## Risk Calculations

A-1 UCL Summaries

A-2 USEPA Adult Lead Model

A-3 RAGS D Tables

A-4 Johnson and Ettinger Model Calculations

A-5 HBRG Calculations

# Appendix B

## Arsenic Statistical Evaluation

# Appendix A

## Risk Calculations

A-1 UCL Summaries

A-2 USEPA Adult Lead Model

A-3 RAGS D Tables

A-4 Johnson and Ettinger Model Calculations

A-5 HBRG Calculations

**Appendix A-1**  
**UCL Summaries**

**A-1.1 Surface Soil 0-1.5 feet**

Raw Statistics		Normal Distribution Test	
Number of Valid Samples	22	Shapiro-Wilk Test Statistic	0.613569
Number of Unique Samples	11	Shapiro-Wilk 5% Critical Value	0.911
Minimum	0.045	Data not normal at 5% significance level	
Maximum	4	95% UCL (Assuming Normal Distribution)	
Mean	0.721136	Student's-t UCL	1.170099
Median	0.1	Gamma Distribution Test	
Standard Deviation	1.223785	A-D Test Statistic	2.701112
Variance	1.49765	A-D 5% Critical Value	0.811005
Coefficient of Variation	1.697023	K-S Test Statistic	0.310717
Skewness	1.781743	K-S 5% Critical Value	0.196691
Gamma Statistics		Data do not follow gamma distribution at 5% significance level	
k hat	0.468834	95% UCLs (Assuming Gamma Distribution)	
k star (bias corrected)	0.435205	Approximate Gamma UCL	1.35054
Theta hat	1.538148	Adjusted Gamma UCL	1.417897
Theta star	1.657003	Lognormal Distribution Test	
nu hat	20.62871	Shapiro-Wilk Test Statistic	0.784913
nu star	19.14903	Shapiro-Wilk 5% Critical Value	0.911
Approx.Chi Square Value (.05)	10.22484	Data not lognormal at 5% significance level	
Adjusted Level of Significance	0.0386	95% UCLs (Assuming Lognormal Distribution)	
Adjusted Chi Square Value	9.739115	95% H-UCL	2.282519
Log-transformed Statistics		95% Chebyshev (MVUE) UCL	1.699121
Minimum of log data	-3.101093	97.5% Chebyshev (MVUE) UCL	2.175389
Maximum of log data	1.386294	99% Chebyshev (MVUE) UCL	3.110927
Mean of log data	-1.695425	95% Non-parametric UCLs	
Standard Deviation of log data	1.612781	CLT UCL	1.150298
Variance of log data	2.601062	Adj-CLT UCL (Adjusted for skewness)	1.256201
RECOMMENDATION		Mod-t UCL (Adjusted for skewness)	1.186617
Data are Non-parametric (0.05)		Jackknife UCL	1.170099
Use 99% Chebyshev (Mean, Sd) UCL		Standard Bootstrap UCL	1.149319
3.317176		Bootstrap-t UCL	1.360649
		Hall's Bootstrap UCL	1.191284
		Percentile Bootstrap UCL	1.148864
		BCA Bootstrap UCL	1.429318
		95% Chebyshev (Mean, Sd) UCL	1.858425
		97.5% Chebyshev (Mean, Sd) UCL	2.35053
		99% Chebyshev (Mean, Sd) UCL	3.317176

<b>Raw Statistics</b>		<b>Normal Distribution Test</b>	
Number of Valid Samples	20	Shapiro-Wilk Test Statistic	0.426424
Number of Unique Samples	13	Shapiro-Wilk 5% Critical Value	0.905
Minimum	0.03	Data not normal at 5% significance level	
Maximum	51	95% UCL (Assuming Normal Distribution)	
Mean	4.50985	Student's-t UCL	8.908617
Median	0.415	<b>Gamma Distribution Test</b>	
Standard Deviation	11.37674	A-D Test Statistic	1.279506
Variance	129.4301	A-D 5% Critical Value	0.835416
Coefficient of Variation	2.522642	K-S Test Statistic	0.209842
Skewness	3.963996	K-S 5% Critical Value	0.20898
<b>Gamma Statistics</b>		Data do not follow gamma distribution at 5% significance level	
k hat	0.344066	95% UCLs (Assuming Gamma Distribution)	
k star (bias corrected)	0.325789	Approximate Gamma UCL	9.939415
Theta hat	13.10751	Adjusted Gamma UCL	10.61452
Theta star	13.84284	<b>Lognormal Distribution Test</b>	
nu hat	13.76264	Shapiro-Wilk Test Statistic	0.927357
nu star	13.03158	Shapiro-Wilk 5% Critical Value	0.905
Approx.Chi Square Value (.05)	5.912869	Data are lognormal at 5% significance level	
Adjusted Level of Significance	0.038	95% UCLs (Assuming Lognormal Distribution)	
Adjusted Chi Square Value	5.536798	95% H-UCL	44.59042
<b>Log-transformed Statistics</b>		95% Chebyshev (MVUE) UCL	14.83881
Minimum of log data	-3.506558	97.5% Chebyshev (MVUE) UCL	19.42963
Maximum of log data	3.931826	99% Chebyshev (MVUE) UCL	28.44741
Mean of log data	-0.453573	<b>95% Non-parametric UCLs</b>	
Standard Deviation of log data	2.082883	CLT UCL	8.694218
Variance of log data	4.3384	Adj-CLT UCL (Adjusted for skewness)	11.10358
<b>RECOMMENDATION</b>		Mod-t UCL (Adjusted for skewness)	9.284428
Data are lognormal (0.05)		Jackknife UCL	8.908617
Use 97.5% Chebyshev (MVUE) UCL		Standard Bootstrap UCL	8.721665
19.42963		Bootstrap-t UCL	19.91625
		Hall's Bootstrap UCL	22.25379
		Percentile Bootstrap UCL	9.36385
		BCA Bootstrap UCL	9.11635
		95% Chebyshev (Mean, Sd) UCL	15.59852
		97.5% Chebyshev (Mean, Sd) UCL	20.3966
		99% Chebyshev (Mean, Sd) UCL	29.82149

Raw Statistics		Normal Distribution Test	
Number of Valid Samples	22	Shapiro-Wilk Test Statistic	0.434883
Number of Unique Samples	17	Shapiro-Wilk 5% Critical Value	0.911
Minimum	8.3	Data not normal at 5% significance level	
Maximum	360	95% UCL (Assuming Normal Distribution)	
Mean	44.46818	Student's-t UCL	72.45548
Median	22	Gamma Distribution Test	
Standard Deviation	76.28804	A-D Test Statistic	3.256944
Variance	5819.865	A-D 5% Critical Value	0.769235
Coefficient of Variation	1.715565	K-S Test Statistic	0.381882
Skewness	3.771119	K-S 5% Critical Value	0.190465
Gamma Statistics		Data do not follow gamma distribution at 5% significance level	
k hat	1.064552	95% UCLs (Assuming Gamma Distribution)	
k star (bias corrected)	0.949688	Approximate Gamma UCL	66.44232
Theta hat	41.77175	Adjusted Gamma UCL	68.51009
Theta star	46.82397	Lognormal Distribution Test	
nu hat	46.84027	Shapiro-Wilk Test Statistic	0.779118
nu star	41.78629	Shapiro-Wilk 5% Critical Value	0.911
Approx. Chi Square Value (.05)	27.96652	Data not lognormal at 5% significance level	
Adjusted Level of Significance	0.0386	95% UCLs (Assuming Lognormal Distribution)	
Adjusted Chi Square Value	27.12244	95% H-UCL	57.59208
Log-transformed Statistics		95% Chebyshev (MVUE) UCL	68.00412
Minimum of log data	2.116256	97.5% Chebyshev (MVUE) UCL	81.66386
Maximum of log data	5.886104	99% Chebyshev (MVUE) UCL	108.4958
Mean of log data	3.256453	95% Non-parametric UCLs	
Standard Deviation of log data	0.849049	CLT UCL	71.22117
Variance of log data	0.720885	Adj-CLT UCL (Adjusted for skewness)	85.19401
RECOMMENDATION		Mod-t UCL (Adjusted for skewness)	74.63496
Data are Non-parametric (0.05)		Jackknife UCL	72.45548
Use 95% Chebyshev (Mean, Sd) UCL		Standard Bootstrap UCL	71.40689
115.3642		Bootstrap-t UCL	137.7806
		Hall's Bootstrap UCL	148.0373
		Percentile Bootstrap UCL	74.3
		BCA Bootstrap UCL	92.88636
		95% Chebyshev (Mean, Sd) UCL	115.3642
		97.5% Chebyshev (Mean, Sd) UCL	146.041
		99% Chebyshev (Mean, Sd) UCL	206.2996

Raw Statistics		Normal Distribution Test	
Number of Valid Samples	22	Shapiro-Wilk Test Statistic	0.396338
Number of Unique Samples	7	Shapiro-Wilk 5% Critical Value	0.911
Minimum	0.00025	Data not normal at 5% significance level	
Maximum	0.05	95% UCL (Assuming Normal Distribution)	
Mean	0.005777	Student's-t UCL	0.009834
Median	0.0025	Gamma Distribution Test	
Standard Deviation	0.011057	A-D Test Statistic	4.81122
Variance	1.22E-04	A-D 5% Critical Value	0.777421
Coefficient of Variation	1.913835	K-S Test Statistic	0.483004
Skewness	3.593843	K-S 5% Critical Value	0.1918
Gamma Statistics		Data do not follow gamma distribution at 5% significance level	
k hat	0.863982	95% UCLs (Assuming Gamma Distribution)	
k star (bias corrected)	0.776469	Approximate Gamma UCL	0.009057
Theta hat	0.006687	Adjusted Gamma UCL	0.009374
Theta star	0.00744	Lognormal Distribution Test	
nu hat	38.01519	Shapiro-Wilk Test Statistic	0.65308
nu star	34.16463	Shapiro-Wilk 5% Critical Value	0.911
Approx. Chi Square Value (.05)	21.79383	Data not lognormal at 5% significance level	
Adjusted Level of Significance	0.0386	95% UCLs (Assuming Lognormal Distribution)	
Adjusted Chi Square Value	21.05629	95% H-UCL	0.008335
Log-transformed Statistics		95% Chebyshev (MVUE) UCL	0.009488
Minimum of log data	-8.29405	97.5% Chebyshev (MVUE) UCL	0.011581
Maximum of log data	-2.995732	99% Chebyshev (MVUE) UCL	0.015693
Mean of log data	-5.833949	95% Non-parametric UCLs	
Standard Deviation of log data	0.994679	CLT UCL	0.009655
Variance of log data	0.989387	Adj-CLT UCL (Adjusted for skewness)	0.011585
RECOMMENDATION		Mod-t UCL (Adjusted for skewness)	0.010135
Data are Non-parametric (0.05)		Jackknife UCL	0.009834
Use 95% Chebyshev (Mean, Sd) UCL		Standard Bootstrap UCL	0.009564
0.016053		Bootstrap-t UCL	0.032137
		Hall's Bootstrap UCL	0.030644
		Percentile Bootstrap UCL	0.01023
		BCA Bootstrap UCL	0.009327
		95% Chebyshev (Mean, Sd) UCL	0.016053
		97.5% Chebyshev (Mean, Sd) UCL	0.020499
		99% Chebyshev (Mean, Sd) UCL	0.029232

Data File P:\10500\_OMEGA\HRA Oct 2006\Draft3 - Jar Variable: IRON

Raw Statistics

Number of Valid Samples	2
Number of Unique Samples	2
Minimum	22100
Maximum	23200
Mean	22650
Median	22650

Too Few Observations To Calculate UCLs

Raw Statistics		Normal Distribution Test	
Number of Valid Samples	22	Shapiro-Wilk Test Statistic	0.882872
Number of Unique Samples	20	Shapiro-Wilk 5% Critical Value	0.911
Minimum	5	Data not normal at 5% significance level	
Maximum	100	95% UCL (Assuming Normal Distribution)	
Mean	32.15	Student's-t UCL	41.68564
Median	23.75	Gamma Distribution Test	
Standard Deviation	25.99232	A-D Test Statistic	0.252658
Variance	675.6007	A-D 5% Critical Value	0.758184
Coefficient of Variation	0.80847	K-S Test Statistic	0.104438
Skewness	1.130055	K-S 5% Critical Value	0.188409
Gamma Statistics		Data follow gamma distribution at 5% significance level	
k hat	1.597616	95% UCLs (Assuming Gamma Distribution)	
k star (bias corrected)	1.410062	Approximate Gamma UCL	44.40281
Theta hat	20.12374	Adjusted Gamma UCL	45.50447
Theta star	22.80041	Lognormal Distribution Test	
nu hat	70.2951	Shapiro-Wilk Test Statistic	0.95838
nu star	62.04273	Shapiro-Wilk 5% Critical Value	0.911
Approx.Chi Square Value (.05)	44.92225	Data are lognormal at 5% significance level	
Adjusted Level of Significance	0.0386	95% UCLs (Assuming Lognormal Distribution)	
Adjusted Chi Square Value	43.83468	95% H-UCL	54.90401
Log-transformed Statistics		95% Chebyshev (MVUE) UCL	64.16449
Minimum of log data	1.609438	97.5% Chebyshev (MVUE) UCL	77.51359
Maximum of log data	4.60517	99% Chebyshev (MVUE) UCL	103.7353
Mean of log data	3.125899	95% Non-parametric UCLs	
Standard Deviation of log data	0.899671	CLT UCL	41.26509
Variance of log data	0.809408	Adj-CLT UCL (Adjusted for skewness)	42.69169
RECOMMENDATION		Mod-t UCL (Adjusted for skewness)	41.90816
Data follow gamma distribution (0.05)		Jackknife UCL	41.68564
Use Approximate Gamma UCL		Standard Bootstrap UCL	40.9581
		Bootstrap-t UCL	43.89042
		Hall's Bootstrap UCL	44.04345
		Percentile Bootstrap UCL	41.37273
		BCA Bootstrap UCL	45.78636
		95% Chebyshev (Mean, Sd) UCL	56.30519
		97.5% Chebyshev (Mean, Sd) UCL	66.75716
		99% Chebyshev (Mean, Sd) UCL	87.28804

44.40281

Raw Statistics		Normal Distribution Test	
Number of Valid Samples	22	Shapiro-Wilk Test Statistic	0.639933
Number of Unique Samples	11	Shapiro-Wilk 5% Critical Value	0.911
Minimum	0.045	Data not normal at 5% significance level	
Maximum	4	95% UCL (Assuming Normal Distribution)	
Mean	0.753864	Student's-t UCL	1.203878
Median	0.1	Gamma Distribution Test	
Standard Deviation	1.226653	A-D Test Statistic	2.644696
Variance	1.504678	A-D 5% Critical Value	0.81118
Coefficient of Variation	1.627155	K-S Test Statistic	0.318178
Skewness	1.684721	K-S 5% Critical Value	0.196713
Gamma Statistics		Data do not follow gamma distribution at 5% significance level	
k hat	0.468026	95% UCLs (Assuming Gamma Distribution)	
k star (bias corrected)	0.434508	Approximate Gamma UCL	1.412669
Theta hat	1.610729	Adjusted Gamma UCL	1.483196
Theta star	1.734983	Lognormal Distribution Test	
nu hat	20.59316	Shapiro-Wilk Test Statistic	0.780313
nu star	19.11834	Shapiro-Wilk 5% Critical Value	0.911
Approx.Chi Square Value (.05)	10.2024	Data not lognormal at 5% significance level	
Adjusted Level of Significance	0.0386	95% UCLs (Assuming Lognormal Distribution)	
Adjusted Chi Square Value	9.717271	95% H-UCL	2.659183
Log-transformed Statistics		95% Chebyshev (MVUE) UCL	1.900131
Minimum of log data	-3.101093	97.5% Chebyshev (MVUE) UCL	2.437704
Maximum of log data	1.386294	99% Chebyshev (MVUE) UCL	3.493663
Mean of log data	-1.653775	95% Non-parametric UCLs	
Standard Deviation of log data	1.65019	CLT UCL	1.184031
Variance of log data	2.723127	Adj-CLT UCL (Adjusted for skewness)	1.284402
RECOMMENDATION		Mod-t UCL (Adjusted for skewness)	1.219534
Data are Non-parametric (0.05)		Jackknife UCL	1.203878
Use 99% Chebyshev (Mean, Sd) UCL		Standard Bootstrap UCL	1.178867
3.355988		Bootstrap-t UCL	1.399961
		Hall's Bootstrap UCL	1.220794
		Percentile Bootstrap UCL	1.199318
		BCA Bootstrap UCL	1.110909
		95% Chebyshev (Mean, Sd) UCL	1.893818
		97.5% Chebyshev (Mean, Sd) UCL	2.387077
		99% Chebyshev (Mean, Sd) UCL	3.355988

Raw Statistics		Normal Distribution Test	
Number of Valid Samples	22	Shapiro-Wilk Test Statistic	0.245503
Number of Unique Samples	5	Shapiro-Wilk 5% Critical Value	0.911
Minimum	0.005	Data not normal at 5% significance level	
Maximum	0.5	95% UCL (Assuming Normal Distribution)	
Mean	0.030205	Student's-t UCL	0.068725
Median	0.005	Gamma Distribution Test	
Standard Deviation	0.105	A-D Test Statistic	5.690499
Variance	0.011025	A-D 5% Critical Value	0.803832
Coefficient of Variation	3.476293	K-S Test Statistic	0.430817
Skewness	4.680235	K-S 5% Critical Value	0.195807
Gamma Statistics		Data do not follow gamma distribution at 5% significance level	
k hat	0.504908	95% UCLs (Assuming Gamma Distribution)	
k star (bias corrected)	0.46636	Approximate Gamma UCL	0.055172
Theta hat	0.059822	Adjusted Gamma UCL	0.057807
Theta star	0.064767	Lognormal Distribution Test	
nu hat	22.21595	Shapiro-Wilk Test Statistic	0.547065
nu star	20.51984	Shapiro-Wilk 5% Critical Value	0.911
Approx. Chi Square Value (.05)	11.23373	Data not lognormal at 5% significance level	
Adjusted Level of Significance	0.0386	95% UCLs (Assuming Lognormal Distribution)	
Adjusted Chi Square Value	10.72172	95% H-UCL	0.024917
Log-transformed Statistics		95% Chebyshev (MVUE) UCL	0.028277
Minimum of log data	-5.298317	97.5% Chebyshev (MVUE) UCL	0.034549
Maximum of log data	-0.693147	99% Chebyshev (MVUE) UCL	0.04687
Mean of log data	-4.755875	95% Non-parametric UCLs	
Standard Deviation of log data	1.003908	CLT UCL	0.067026
Variance of log data	1.00783	Adj-CLT UCL (Adjusted for skewness)	0.090894
RECOMMENDATION		Mod-t UCL (Adjusted for skewness)	0.072448
Data are Non-parametric (0.05)		Jackknife UCL	0.068725
Use 99% Chebyshev (Mean, Sd) UCL		Standard Bootstrap UCL	0.066733
0.252943		Bootstrap-t UCL	0.780955
		Hall's Bootstrap UCL	0.363165
		Percentile Bootstrap UCL	0.074773
		BCA Bootstrap UCL	0.097795
		95% Chebyshev (Mean, Sd) UCL	0.127783
		97.5% Chebyshev (Mean, Sd) UCL	0.170005
		99% Chebyshev (Mean, Sd) UCL	0.252943

Raw Statistics		Normal Distribution Test	
Number of Valid Samples	20	Shapiro-Wilk Test Statistic	0.616766
Number of Unique Samples	10	Shapiro-Wilk 5% Critical Value	0.905
Minimum	0.013	Data not normal at 5% significance level	
Maximum	4	95% UCL (Assuming Normal Distribution)	
Mean	0.74915	Student's-t UCL	1.245949
Median	0.05	Gamma Distribution Test	
Standard Deviation	1.284894	A-D Test Statistic	2.770018
Variance	1.650953	A-D 5% Critical Value	0.823441
Coefficient of Variation	1.715136	K-S Test Statistic	0.356713
Skewness	1.643178	K-S 5% Critical Value	0.207498
Gamma Statistics		Data do not follow gamma distribution at 5% significance level	
k hat	0.40085	95% UCLs (Assuming Gamma Distribution)	
k star (bias corrected)	0.374056	Approximate Gamma UCL	1.549462
Theta hat	1.868905	Adjusted Gamma UCL	1.645533
Theta star	2.002777	Lognormal Distribution Test	
nu hat	16.03399	Shapiro-Wilk Test Statistic	0.787802
nu star	14.96223	Shapiro-Wilk 5% Critical Value	0.905
Approx. Chi Square Value (.05)	7.234092	Data not lognormal at 5% significance level	
Adjusted Level of Significance	0.038	95% UCLs (Assuming Lognormal Distribution)	
Adjusted Chi Square Value	6.811745	95% H-UCL	3.79319
Log-transformed Statistics		95% Chebyshev (MVUE) UCL	1.985954
Minimum of log data	-4.342806	97.5% Chebyshev (MVUE) UCL	2.573833
Maximum of log data	1.386294	99% Chebyshev (MVUE) UCL	3.728609
Mean of log data	-1.929861	95% Non-parametric UCLs	
Standard Deviation of log data	1.813847	CLT UCL	1.221735
Variance of log data	3.29004	Adj-CLT UCL (Adjusted for skewness)	1.334533
RECOMMENDATION		Mod-t UCL (Adjusted for skewness)	1.263543
Data are Non-parametric (0.05)		Jackknife UCL	1.245949
Use 99% Chebyshev (Mean, Sd) UCL		Standard Bootstrap UCL	1.209456
3.607859		Bootstrap-t UCL	1.462784
		Hall's Bootstrap UCL	1.25754
		Percentile Bootstrap UCL	1.2154
		BCA Bootstrap UCL	1.55425
		95% Chebyshev (Mean, Sd) UCL	2.00151
		97.5% Chebyshev (Mean, Sd) UCL	2.543407
		99% Chebyshev (Mean, Sd) UCL	3.607859

## **A-1.2 Surface and Subsurface Soil 0-30 feet**

Raw Statistics		Normal Distribution Test	
Number of Valid Samples	66	Lilliefors Test Statistic	0.508995
Number of Unique Samples	33	Lilliefors 5% Critical Value	0.109059
Minimum	0.000415	Data not normal at 5% significance level	
Maximum	1200	95% UCL (Assuming Normal Distribution)	
Mean	33.58774	Student's-t UCL	72.28229
Median	0.0485	Gamma Distribution Test	
Standard Deviation	188.391	A-D Test Statistic	11.67595
Variance	35491.17	A-D 5% Critical Value	0.973389
Coefficient of Variation	5.608921	K-S Test Statistic	0.372342
Skewness	5.708425	K-S 5% Critical Value	0.124606
Gamma Statistics		Data do not follow gamma distribution at 5% significance level	
k hat	0.119444	95% UCLs (Assuming Gamma Distribution)	
k star (bias corrected)	0.124116	Approximate Gamma UCL	66.84635
Theta hat	281.2009	Adjusted Gamma UCL	67.91364
Theta star	270.6165	Lognormal Distribution Test	
nu hat	15.7666	Lilliefors Test Statistic	0.153171
nu star	16.38327	Lilliefors 5% Critical Value	0.109059
Approx. Chi Square Value (.05)	8.231969	Data not lognormal at 5% significance level	
Adjusted Level of Significance	0.046364	95% UCLs (Assuming Lognormal Distribution)	
Adjusted Chi Square Value	8.1026	95% H-UCL	104.3711
Log-transformed Statistics		95% Chebyshev (MVUE) UCL	30.61232
Minimum of log data	-7.787232	97.5% Chebyshev (MVUE) UCL	40.61522
Maximum of log data	7.090077	99% Chebyshev (MVUE) UCL	60.26397
Mean of log data	-3.129291	95% Non-parametric UCLs	
Standard Deviation of log data	3.349014	CLT UCL	71.7308
Variance of log data	11.2159	Adj-CLT UCL (Adjusted for skewness)	89.14136
RECOMMENDATION		Mod-t UCL (Adjusted for skewness)	74.99798
Data are Non-parametric (0.05)		Jackknife UCL	72.28229
Use 99% Chebyshev (Mean, Sd) UCL		Standard Bootstrap UCL	72.02589
		Bootstrap-t UCL	3013.517
		Hall's Bootstrap UCL	2391.789
		Percentile Bootstrap UCL	77.38499
		BCA Bootstrap UCL	110.2372
		95% Chebyshev (Mean, Sd) UCL	134.6677
		97.5% Chebyshev (Mean, Sd) UCL	178.4051
		99% Chebyshev (Mean, Sd) UCL	264.3187

264.3187

Raw Statistics		Normal Distribution Test	
Number of Valid Samples	66	Lilliefors Test Statistic	0.495128
Number of Unique Samples	30	Lilliefors 5% Critical Value	0.109059
Minimum	0.0025	Data not normal at 5% significance level	
Maximum	590	95% UCL (Assuming Normal Distribution)	
Mean	16.80846	Student's-t UCL	34.98572
Median	0.144	Gamma Distribution Test	
Standard Deviation	88.49909	A-D Test Statistic	11.69724
Variance	7832.089	A-D 5% Critical Value	0.95156
Coefficient of Variation	5.265152	K-S Test Statistic	0.427759
Skewness	5.805307	K-S 5% Critical Value	0.123582
Gamma Statistics		Data do not follow gamma distribution at 5% significance level	
k hat	0.147079	95% UCLs (Assuming Gamma Distribution)	
k star (bias corrected)	0.150494	Approximate Gamma UCL	31.05978
Theta hat	114.2822	Adjusted Gamma UCL	31.49969
Theta star	111.6884	Lognormal Distribution Test	
nu hat	19.41437	Lilliefors Test Statistic	0.19344
nu star	19.86523	Lilliefors 5% Critical Value	0.109059
Approx.Chi Square Value (.05)	10.75036	Data not lognormal at 5% significance level	
Adjusted Level of Significance	0.046364	95% UCLs (Assuming Lognormal Distribution)	
Adjusted Chi Square Value	10.60023	95% H-UCL	31.50705
Log-transformed Statistics		95% Chebyshev (MVUE) UCL	16.51981
Minimum of log data	-5.991465	97.5% Chebyshev (MVUE) UCL	21.70304
Maximum of log data	6.380123	99% Chebyshev (MVUE) UCL	31.8845
Mean of log data	-2.418682	95% Non-parametric UCLs	
Standard Deviation of log data	2.904959	CLT UCL	34.72665
Variance of log data	8.438785	Adj-CLT UCL (Adjusted for skewness)	43.04429
RECOMMENDATION		Mod-t UCL (Adjusted for skewness)	36.2831
Data are Non-parametric (0.05)		Jackknife UCL	34.98572
Use 99% Chebyshev (Mean, Sd) UCL		Standard Bootstrap UCL	34.31698
		Bootstrap-t UCL	245.1938
		Hall's Bootstrap UCL	289.1124
		Percentile Bootstrap UCL	34.9989
		BCA Bootstrap UCL	50.67923
		95% Chebyshev (Mean, Sd) UCL	64.29206
		97.5% Chebyshev (Mean, Sd) UCL	84.83825
		99% Chebyshev (Mean, Sd) UCL	125.1973

125.1973

Raw Statistics		Normal Distribution Test	
Number of Valid Samples	66	Lilliefors Test Statistic	0.497458
Number of Unique Samples	28	Lilliefors 5% Critical Value	0.109059
Minimum	0.0019	Data not normal at 5% significance level	
Maximum	60	95% UCL (Assuming Normal Distribution)	
Mean	2.088383	Student's-t UCL	3.856003
Median	0.1475	Gamma Distribution Test	
Standard Deviation	8.605962	A-D Test Statistic	8.765381
Variance	74.06257	A-D 5% Critical Value	0.905768
Coefficient of Variation	4.120874	K-S Test Statistic	0.405927
Skewness	5.475862	K-S 5% Critical Value	0.121405
Gamma Statistics		Data do not follow gamma distribution at 5% significance level	
k hat	0.208855	95% UCLs (Assuming Gamma Distribution)	
k star (bias corrected)	0.209463	Approximate Gamma UCL	3.467313
Theta hat	9.9992	Adjusted Gamma UCL	3.507529
Theta star	9.970195	Lognormal Distribution Test	
nu hat	27.56885	Lilliefors Test Statistic	0.203777
nu star	27.64906	Lilliefors 5% Critical Value	0.109059
Approx. Chi Square Value (.05)	16.65319	Data not lognormal at 5% significance level	
Adjusted Level of Significance	0.046364	95% UCLs (Assuming Lognormal Distribution)	
Adjusted Chi Square Value	16.46225	95% H-UCL	6.095129
Log-transformed Statistics		95% Chebyshev (MVUE) UCL	4.406648
Minimum of log data	-6.265901	97.5% Chebyshev (MVUE) UCL	5.726417
Maximum of log data	4.094345	99% Chebyshev (MVUE) UCL	8.318849
Mean of log data	-2.763382	95% Non-parametric UCLs	
Standard Deviation of log data	2.551359	CLT UCL	3.83081
Variance of log data	6.509435	Adj-CLT UCL (Adjusted for skewness)	4.593746
RECOMMENDATION		Mod-t UCL (Adjusted for skewness)	3.975005
Data are Non-parametric (0.05)		Jackknife UCL	3.856003
Use 99% Chebyshev (Mean, Sd) UCL		Standard Bootstrap UCL	3.78884
		Bootstrap-t UCL	6.41719
		Hall's Bootstrap UCL	5.059547
		Percentile Bootstrap UCL	3.885054
		BCA Bootstrap UCL	5.330551
		95% Chebyshev (Mean, Sd) UCL	6.705854
		97.5% Chebyshev (Mean, Sd) UCL	8.703838
		99% Chebyshev (Mean, Sd) UCL	12.62849

12.62849

Raw Statistics		Normal Distribution Test	
Number of Valid Samples	65	Lilliefors Test Statistic	0.4885
Number of Unique Samples	24	Lilliefors 5% Critical Value	0.109895
Minimum	0.000415	Data not normal at 5% significance level	
Maximum	25	95% UCL (Assuming Normal Distribution)	
Mean	1.598884	Student's-t UCL	2.74564
Median	0.05	Gamma Distribution Test	
Standard Deviation	5.53947	A-D Test Statistic	6.434176
Variance	30.68573	A-D 5% Critical Value	0.914485
Coefficient of Variation	3.464586	K-S Test Statistic	0.343162
Skewness	3.859455	K-S 5% Critical Value	0.122767
Gamma Statistics		Data do not follow gamma distribution at 5% significance level	
k hat	0.193992	95% UCLs (Assuming Gamma Distribution)	
k star (bias corrected)	0.195295	Approximate Gamma UCL	2.723006
Theta hat	8.242014	Adjusted Gamma UCL	2.75677
Theta star	8.187026	Lognormal Distribution Test	
nu hat	25.21894	Lilliefors Test Statistic	0.20058
nu star	25.38833	Lilliefors 5% Critical Value	0.109895
Approx.Chi Square Value (.05)	14.90742	Data not lognormal at 5% significance level	
Adjusted Level of Significance	0.046308	95% UCLs (Assuming Lognormal Distribution)	
Adjusted Chi Square Value	14.72483	95% H-UCL	23.00954
Log-transformed Statistics		95% Chebyshev (MVUE) UCL	10.11344
Minimum of log data	-7.787232	97.5% Chebyshev (MVUE) UCL	13.33963
Maximum of log data	3.218876	99% Chebyshev (MVUE) UCL	19.67684
Mean of log data	-3.342291	95% Non-parametric UCLs	
Standard Deviation of log data	3.054371	CLT UCL	2.729041
Variance of log data	9.329184	Adj-CLT UCL (Adjusted for skewness)	3.080489
RECOMMENDATION		Mod-t UCL (Adjusted for skewness)	2.800459
Data are Non-parametric (0.05)		Jackknife UCL	2.74564
Use 99% Chebyshev (Mean, Sd) UCL		Standard Bootstrap UCL	2.715085
8.43531		Bootstrap-t UCL	3.533788
		Hall's Bootstrap UCL	2.55046
		Percentile Bootstrap UCL	2.871723
		BCA Bootstrap UCL	3.484869
		95% Chebyshev (Mean, Sd) UCL	4.593825
		97.5% Chebyshev (Mean, Sd) UCL	5.889739
		99% Chebyshev (Mean, Sd) UCL	8.43531

Data File P:\10500\_OMEGA\data\RA Data - Oct 2006\ Variable: 1,4-DIOXANE

Raw Statistics		Normal Distribution Test	
Number of Valid Samples	38	Shapiro-Wilk Test Statistic	0.381188
Number of Unique Samples	19	Shapiro-Wilk 5% Critical Value	0.938
Minimum	0.0125	Data not normal at 5% significance level	
Maximum	41	95% UCL (Assuming Normal Distribution)	
Mean	2.687487	Student's-t UCL	4.936147
Median	0.093	Gamma Distribution Test	
Standard Deviation	8.216305	A-D Test Statistic	5.436967
Variance	67.50767	A-D 5% Critical Value	0.885092
Coefficient of Variation	3.057245	K-S Test Statistic	0.357895
Skewness	3.793659	K-S 5% Critical Value	0.157362
Gamma Statistics		Data do not follow gamma distribution at 5% significance level	
k hat	0.237036	95% UCLs (Assuming Gamma Distribution)	
k star (bias corrected)	0.235867	Approximate Gamma UCL	5.160224
Theta hat	11.33788	Adjusted Gamma UCL	5.306515
Theta star	11.3941	Lognormal Distribution Test	
nu hat	18.01474	Shapiro-Wilk Test Statistic	0.831919
nu star	17.92586	Shapiro-Wilk 5% Critical Value	0.938
Approx. Chi Square Value (.05)	9.335935	Data not lognormal at 5% significance level	
Adjusted Level of Significance	0.0434	95% UCLs (Assuming Lognormal Distribution)	
Adjusted Chi Square Value	9.078559	95% H-UCL	7.538395
Log-transformed Statistics		95% Chebyshev (MVUE) UCL	4.451912
Minimum of log data	-4.382027	97.5% Chebyshev (MVUE) UCL	5.792685
Maximum of log data	3.713572	99% Chebyshev (MVUE) UCL	8.426374
Mean of log data	-2.033705	95% Non-parametric UCLs	
Standard Deviation of log data	2.25343	CLT UCL	4.879848
Variance of log data	5.077946	Adj-CLT UCL (Adjusted for skewness)	5.756307
RECOMMENDATION		Mod-t UCL (Adjusted for skewness)	5.072857
Data are Non-parametric (0.05)		Jackknife UCL	4.936147
Use 99% Chebyshev (Mean, Sd) UCL		Standard Bootstrap UCL	4.853265
15.94928		Bootstrap-t UCL	8.355232
		Hall's Bootstrap UCL	11.0263
		Percentile Bootstrap UCL	5.085395
		BCA Bootstrap UCL	6.786211
		95% Chebyshev (Mean, Sd) UCL	8.497292
		97.5% Chebyshev (Mean, Sd) UCL	11.0112
		99% Chebyshev (Mean, Sd) UCL	15.94928

Raw Statistics		Normal Distribution Test	
Number of Valid Samples	43	Shapiro-Wilk Test Statistic	0.482957
Number of Unique Samples	14	Shapiro-Wilk 5% Critical Value	0.943
Minimum	0.045	Data not normal at 5% significance level	
Maximum	4	95% UCL (Assuming Normal Distribution)	
Mean	0.449302	Student's-t UCL	0.684192
Median	0.1	Gamma Distribution Test	
Standard Deviation	0.915765	A-D Test Statistic	6.342937
Variance	0.838626	A-D 5% Critical Value	0.805468
Coefficient of Variation	2.038194	K-S Test Statistic	0.348743
Skewness	2.851316	K-S 5% Critical Value	0.141816
Gamma Statistics		Data do not follow gamma distribution at 5% significance level	
k hat	0.582135	95% UCLs (Assuming Gamma Distribution)	
k star (bias corrected)	0.557025	Approximate Gamma UCL	0.651915
Theta hat	0.771818	Adjusted Gamma UCL	0.66052
Theta star	0.806611	Lognormal Distribution Test	
nu hat	50.06361	Shapiro-Wilk Test Statistic	0.772164
nu star	47.90413	Shapiro-Wilk 5% Critical Value	0.943
Approx. Chi Square Value (.05)	33.01571	Data not lognormal at 5% significance level	
Adjusted Level of Significance	0.044419	95% UCLs (Assuming Lognormal Distribution)	
Adjusted Chi Square Value	32.58561	95% H-UCL	0.544145
Log-transformed Statistics		95% Chebyshev (MVUE) UCL	0.645612
Minimum of log data	-3.101093	97.5% Chebyshev (MVUE) UCL	0.786108
Maximum of log data	1.386294	99% Chebyshev (MVUE) UCL	1.062085
Mean of log data	-1.866223	95% Non-parametric UCLs	
Standard Deviation of log data	1.232312	CLT UCL	0.679011
Variance of log data	1.518594	Adj-CLT UCL (Adjusted for skewness)	0.743895
RECOMMENDATION		Mod-t UCL (Adjusted for skewness)	0.694312
Data are Non-parametric (0.05)		Jackknife UCL	0.684192
Use 99% Chebyshev (Mean, Sd) UCL		Standard Bootstrap UCL	0.671245
1.838831		Bootstrap-t UCL	0.82647
		Hall's Bootstrap UCL	0.723052
		Percentile Bootstrap UCL	0.697093
		BCA Bootstrap UCL	0.660233
		95% Chebyshev (Mean, Sd) UCL	1.058035
		97.5% Chebyshev (Mean, Sd) UCL	1.321434
		99% Chebyshev (Mean, Sd) UCL	1.838831

Raw Statistics		Normal Distribution Test	
Number of Valid Samples	40	Shapiro-Wilk Test Statistic	0.512152
Number of Unique Samples	11	Shapiro-Wilk 5% Critical Value	0.94
Minimum	0.032	Data not normal at 5% significance level	
Maximum	4	95% UCL (Assuming Normal Distribution)	
Mean	0.50555	Student's-t UCL	0.771377
Median	0.1	Gamma Distribution Test	
Standard Deviation	0.997842	A-D Test Statistic	6.630065
Variance	0.995688	A-D 5% Critical Value	0.811462
Coefficient of Variation	1.973775	K-S Test Statistic	0.414986
Skewness	2.405488	K-S 5% Critical Value	0.147379
Gamma Statistics		Data do not follow gamma distribution at 5% significance level	
k hat	0.517252	95% UCLs (Assuming Gamma Distribution)	
k star (bias corrected)	0.495125	Approximate Gamma UCL	0.76462
Theta hat	0.977376	Adjusted Gamma UCL	0.776775
Theta star	1.021055	Lognormal Distribution Test	
nu hat	41.38019	Shapiro-Wilk Test Statistic	0.741309
nu star	39.61	Shapiro-Wilk 5% Critical Value	0.94
Approx. Chi Square Value (.05)	26.18927	Data not lognormal at 5% significance level	
Adjusted Level of Significance	0.044	95% UCLs (Assuming Lognormal Distribution)	
Adjusted Chi Square Value	25.77946	95% H-UCL	0.674838
Log-transformed Statistics		95% Chebyshev (MVUE) UCL	0.770414
Minimum of log data	-3.442019	97.5% Chebyshev (MVUE) UCL	0.950247
Maximum of log data	1.386294	99% Chebyshev (MVUE) UCL	1.303496
Mean of log data	-1.903681	95% Non-parametric UCLs	
Standard Deviation of log data	1.347857	CLT UCL	0.765063
Variance of log data	1.816718	Adj-CLT UCL (Adjusted for skewness)	0.829182
RECOMMENDATION		Mod-t UCL (Adjusted for skewness)	0.781378
Data are Non-parametric (0.05)		Jackknife UCL	0.771377
Use 99% Chebyshev (Mean, Sd) UCL		Standard Bootstrap UCL	0.759355
		Bootstrap-t UCL	0.86927
		Hall's Bootstrap UCL	0.787641
		Percentile Bootstrap UCL	0.7818
		BCA Bootstrap UCL	0.90555
		95% Chebyshev (Mean, Sd) UCL	1.193265
		97.5% Chebyshev (Mean, Sd) UCL	1.49084
		99% Chebyshev (Mean, Sd) UCL	2.075368

2.075368

Raw Statistics		Normal Distribution Test	
Number of Valid Samples	40	Shapiro-Wilk Test Statistic	0.508241
Number of Unique Samples	10	Shapiro-Wilk 5% Critical Value	0.94
Minimum	0.045	Data not normal at 5% significance level	
Maximum	4	95% UCL (Assuming Normal Distribution)	
Mean	0.486	Student's-t UCL	0.7434
Median	0.1	Gamma Distribution Test	
Standard Deviation	0.966207	A-D Test Statistic	6.640217
Variance	0.933557	A-D 5% Critical Value	0.80999
Coefficient of Variation	1.988081	K-S Test Statistic	0.415799
Skewness	2.549616	K-S 5% Critical Value	0.147219
Gamma Statistics		Data do not follow gamma distribution at 5% significance level	
k hat	0.532581	95% UCLs (Assuming Gamma Distribution)	
k star (bias corrected)	0.509304	Approximate Gamma UCL	0.730307
Theta hat	0.912537	Adjusted Gamma UCL	0.741729
Theta star	0.954243	Lognormal Distribution Test	
nu hat	42.60647	Shapiro-Wilk Test Statistic	0.727297
nu star	40.74432	Shapiro-Wilk 5% Critical Value	0.94
Approx. Chi Square Value (.05)	27.11426	Data not lognormal at 5% significance level	
Adjusted Level of Significance	0.044	95% UCLs (Assuming Lognormal Distribution)	
Adjusted Chi Square Value	26.69674	95% H-UCL	0.633469
Log-transformed Statistics		95% Chebyshev (MVUE) UCL	0.729596
Minimum of log data	-3.101093	97.5% Chebyshev (MVUE) UCL	0.897518
Maximum of log data	1.386294	99% Chebyshev (MVUE) UCL	1.227368
Mean of log data	-1.90266	95% Non-parametric UCLs	
Standard Deviation of log data	1.316452	CLT UCL	0.737286
Variance of log data	1.733045	Adj-CLT UCL (Adjusted for skewness)	0.803092
RECOMMENDATION		Mod-t UCL (Adjusted for skewness)	0.753664
Data are Non-parametric (0.05)		Jackknife UCL	0.7434
Use 99% Chebyshev (Mean, Sd) UCL		Standard Bootstrap UCL	0.740412
2.00605		Bootstrap-t UCL	0.865461
		Hall's Bootstrap UCL	0.769336
		Percentile Bootstrap UCL	0.743625
		BCA Bootstrap UCL	0.6985
		95% Chebyshev (Mean, Sd) UCL	1.151912
		97.5% Chebyshev (Mean, Sd) UCL	1.440053
		99% Chebyshev (Mean, Sd) UCL	2.00605

Raw Statistics		Normal Distribution Test	
Number of Valid Samples	40	Shapiro-Wilk Test Statistic	0.495653
Number of Unique Samples	10	Shapiro-Wilk 5% Critical Value	0.94
Minimum	0.045	Data not normal at 5% significance level	
Maximum	4	95% UCL (Assuming Normal Distribution)	
Mean	0.46875	Student's-t UCL	0.722328
Median	0.1	Gamma Distribution Test	
Standard Deviation	0.951862	A-D Test Statistic	6.539496
Variance	0.906041	A-D 5% Critical Value	0.809147
Coefficient of Variation	2.030638	K-S Test Statistic	0.413797
Skewness	2.682994	K-S 5% Critical Value	0.147127
Gamma Statistics		Data do not follow gamma distribution at 5% significance level	
k hat	0.541354	95% UCLs (Assuming Gamma Distribution)	
k star (bias corrected)	0.517419	Approximate Gamma UCL	0.701871
Theta hat	0.865884	Adjusted Gamma UCL	0.712748
Theta star	0.905938	Lognormal Distribution Test	
nu hat	43.30833	Shapiro-Wilk Test Statistic	0.733319
nu star	41.39354	Shapiro-Wilk 5% Critical Value	0.94
Approx. Chi Square Value (.05)	27.64499	Data not lognormal at 5% significance level	
Adjusted Level of Significance	0.044	95% UCLs (Assuming Lognormal Distribution)	
Adjusted Chi Square Value	27.22311	95% H-UCL	0.59612
Log-transformed Statistics		95% Chebyshev (MVUE) UCL	0.690755
Minimum of log data	-3.101093	97.5% Chebyshev (MVUE) UCL	0.848031
Maximum of log data	1.386294	99% Chebyshev (MVUE) UCL	1.156971
Mean of log data	-1.916768	95% Non-parametric UCLs	
Standard Deviation of log data	1.293191	CLT UCL	0.716305
Variance of log data	1.672344	Adj-CLT UCL (Adjusted for skewness)	0.784525
RECOMMENDATION		Mod-t UCL (Adjusted for skewness)	0.732969
Data are Non-parametric (0.05)		Jackknife UCL	0.722328
Use 99% Chebyshev (Mean, Sd) UCL		Standard Bootstrap UCL	0.715192
1.966231		Bootstrap-t UCL	0.902814
		Hall's Bootstrap UCL	0.761713
		Percentile Bootstrap UCL	0.742625
		BCA Bootstrap UCL	0.701125
		95% Chebyshev (Mean, Sd) UCL	1.124775
		97.5% Chebyshev (Mean, Sd) UCL	1.408638
		99% Chebyshev (Mean, Sd) UCL	1.966231

Raw Statistics		Normal Distribution Test	
Number of Valid Samples	41	Shapiro-Wilk Test Statistic	0.344972
Number of Unique Samples	20	Shapiro-Wilk 5% Critical Value	0.941
Minimum	0.03	Data not normal at 5% significance level	
Maximum	51	95% UCL (Assuming Normal Distribution)	
Mean	2.715293	Student's-t UCL	4.847586
Median	0.2	Gamma Distribution Test	
Standard Deviation	8.108402	A-D Test Statistic	3.793438
Variance	65.74619	A-D 5% Critical Value	0.839958
Coefficient of Variation	2.986198	K-S Test Statistic	0.299756
Skewness	5.56684	K-S 5% Critical Value	0.148206
Gamma Statistics		Data do not follow gamma distribution at 5% significance level	
k hat	0.381893	95% UCLs (Assuming Gamma Distribution)	
k star (bias corrected)	0.37021	Approximate Gamma UCL	4.391087
Theta hat	7.110091	Adjusted Gamma UCL	4.470534
Theta star	7.334474	Lognormal Distribution Test	
nu hat	31.31521	Shapiro-Wilk Test Statistic	0.886997
nu star	30.35719	Shapiro-Wilk 5% Critical Value	0.941
Approx.Chi Square Value (.05)	18.77181	Data not lognormal at 5% significance level	
Adjusted Level of Significance	0.044146	95% UCLs (Assuming Lognormal Distribution)	
Adjusted Chi Square Value	18.43821	95% H-UCL	5.688145
Log-transformed Statistics		95% Chebyshev (MVUE) UCL	5.441398
Minimum of log data	-3.506558	97.5% Chebyshev (MVUE) UCL	6.903742
Maximum of log data	3.931826	99% Chebyshev (MVUE) UCL	9.776231
Mean of log data	-0.737136	95% Non-parametric UCLs	
Standard Deviation of log data	1.759769	CLT UCL	4.798203
Variance of log data	3.096788	Adj-CLT UCL (Adjusted for skewness)	5.974564
RECOMMENDATION		Mod-t UCL (Adjusted for skewness)	5.031075
Data are Non-parametric (0.05)		Jackknife UCL	4.847586
Use 99% Chebyshev (Mean, Sd) UCL		Standard Bootstrap UCL	4.707702
		Bootstrap-t UCL	9.556824
		Hall's Bootstrap UCL	11.78957
		Percentile Bootstrap UCL	5.098293
		BCA Bootstrap UCL	4.959439
		95% Chebyshev (Mean, Sd) UCL	8.235052
		97.5% Chebyshev (Mean, Sd) UCL	10.62346
		99% Chebyshev (Mean, Sd) UCL	15.31501

15.31501

Raw Statistics		Normal Distribution Test	
Number of Valid Samples	44	Shapiro-Wilk Test Statistic	0.438479
Number of Unique Samples	29	Shapiro-Wilk 5% Critical Value	0.944
Minimum	5.6	Data not normal at 5% significance level	
Maximum	360	95% UCL (Assuming Normal Distribution)	
Mean	36.88864	Student's-t UCL	52.44237
Median	20	Gamma Distribution Test	
Standard Deviation	61.37268	A-D Test Statistic	5.124401
Variance	3766.606	A-D 5% Critical Value	0.77364
Coefficient of Variation	1.663729	K-S Test Statistic	0.325005
Skewness	4.191398	K-S 5% Critical Value	0.136691
Gamma Statistics		Data do not follow gamma distribution at 5% significance level	
k hat	1.183957	95% UCLs (Assuming Gamma Distribution)	
k star (bias corrected)	1.118384	Approximate Gamma UCL	47.44
Theta hat	31.15707	Adjusted Gamma UCL	47.84907
Theta star	32.98387	Lognormal Distribution Test	
nu hat	104.1882	Shapiro-Wilk Test Statistic	0.844926
nu star	98.41781	Shapiro-Wilk 5% Critical Value	0.944
Approx. Chi Square Value (.05)	76.52823	Data not lognormal at 5% significance level	
Adjusted Level of Significance	0.044545	95% UCLs (Assuming Lognormal Distribution)	
Adjusted Chi Square Value	75.87396	95% H-UCL	40.77602
Log-transformed Statistics		95% Chebyshev (MVUE) UCL	49.3415
Minimum of log data	1.722767	97.5% Chebyshev (MVUE) UCL	57.22021
Maximum of log data	5.886104	99% Chebyshev (MVUE) UCL	72.6964
Mean of log data	3.129476	95% Non-parametric UCLs	
Standard Deviation of log data	0.797675	CLT UCL	52.10728
Variance of log data	0.636286	Adj-CLT UCL (Adjusted for skewness)	58.35414
RECOMMENDATION		Mod-t UCL (Adjusted for skewness)	53.41675
Data are Non-parametric (0.05)		Jackknife UCL	52.44237
Use 95% Chebyshev (Mean, Sd) UCL		Standard Bootstrap UCL	51.62959
77.21839		Bootstrap-t UCL	78.04219
		Hall's Bootstrap UCL	104.7919
		Percentile Bootstrap UCL	52.98409
		BCA Bootstrap UCL	63.21136
		95% Chebyshev (Mean, Sd) UCL	77.21839
		97.5% Chebyshev (Mean, Sd) UCL	94.6691
		99% Chebyshev (Mean, Sd) UCL	128.9477

Data File P:\10500\_OMEGA\data\RA Data - Oct 2006\ Variable: DIELDRIN

<b>Raw Statistics</b>		<b>Normal Distribution Test</b>	
Number of Valid Samples	43	Shapiro-Wilk Test Statistic	0.383022
Number of Unique Samples	11	Shapiro-Wilk 5% Critical Value	0.943
Minimum	0.00025	Data not normal at 5% significance level	
Maximum	0.1025	95% UCL (Assuming Normal Distribution)	
Mean	0.006762	Student's-t UCL	0.011545
Median	0.00175	<b>Gamma Distribution Test</b>	
Standard Deviation	0.018647	A-D Test Statistic	5.811941
Variance	0.000348	A-D 5% Critical Value	0.832625
Coefficient of Variation	2.757792	K-S Test Statistic	0.389178
Skewness	4.057412	K-S 5% Critical Value	0.144218
<b>Gamma Statistics</b>		Data do not follow gamma distribution at 5% significance level	
k hat	0.417622	95% UCLs (Assuming Gamma Distribution)	
k star (bias corrected)	0.40399	Approximate Gamma UCL	0.010555
Theta hat	0.016191	Adjusted Gamma UCL	0.010723
Theta star	0.016737	<b>Lognormal Distribution Test</b>	
nu hat	35.91553	Shapiro-Wilk Test Statistic	0.802981
nu star	34.74313	Shapiro-Wilk 5% Critical Value	0.943
Approx. Chi Square Value (.05)	22.25694	Data not lognormal at 5% significance level	
Adjusted Level of Significance	0.044419	95% UCLs (Assuming Lognormal Distribution)	
Adjusted Chi Square Value	21.90886	95% H-UCL	0.009056
<b>Log-transformed Statistics</b>		95% Chebyshev (MVUE) UCL	0.009919
Minimum of log data	-8.29405	97.5% Chebyshev (MVUE) UCL	0.012368
Maximum of log data	-2.277892	99% Chebyshev (MVUE) UCL	0.01718
Mean of log data	-6.561289	<b>95% Non-parametric UCLs</b>	
Standard Deviation of log data	1.520684	CLT UCL	0.011439
Variance of log data	2.312479	Adj-CLT UCL (Adjusted for skewness)	0.013319
<b>RECOMMENDATION</b>		Mod-t UCL (Adjusted for skewness)	0.011838
Data are Non-parametric (0.05)		Jackknife UCL	0.011545
Use 99% Chebyshev (Mean, Sd) UCL		Standard Bootstrap UCL	0.011387
0.035056		Bootstrap-t UCL	0.017823
		Hall's Bootstrap UCL	0.013327
		Percentile Bootstrap UCL	0.011542
		BCA Bootstrap UCL	0.015363
		95% Chebyshev (Mean, Sd) UCL	0.019157
		97.5% Chebyshev (Mean, Sd) UCL	0.02452
		99% Chebyshev (Mean, Sd) UCL	0.035056

Data File P:\10500\_OMEGA\data\RA Data - Oct 2006\ Variable: IRON

Raw Statistics		Normal Distribution Test	
Number of Valid Samples	4	Shapiro-Wilk Test Statistic	0.763311
Number of Unique Samples	4	Shapiro-Wilk 5% Critical Value	0.748
Minimum	22100	Data are normal at 5% significance level	
Maximum	23300	95% UCL (Assuming Normal Distribution)	
Mean	22925	Student's-t UCL	23579.27
Median	23150	Gamma Distribution Test	
Standard Deviation	556.0276	A-D Test Statistic	0.655699
Variance	309166.7	A-D 5% Critical Value	0.65652
Coefficient of Variation	0.024254	K-S Test Statistic	0.393102
Skewness	-1.871671	K-S 5% Critical Value	0.39399
Gamma Statistics		Data follow gamma distribution at 5% significance level	
k hat	2231.793	95% UCLs (Assuming Gamma Distribution)	
k star (bias corrected)	558.115	Approximate Gamma UCL	23745.73
Theta hat	10.27201	Adjusted Gamma UCL	N/A
Theta star	41.07577	Lognormal Distribution Test	
nu hat	17854.35	Shapiro-Wilk Test Statistic	0.760375
nu star	4464.92	Shapiro-Wilk 5% Critical Value	0.748
Approx. Chi Square Value (.05)	4310.597	Data are lognormal at 5% significance level	
Adjusted Level of Significance	N/A	95% UCLs (Assuming Lognormal Distribution)	
Adjusted Chi Square Value	N/A	95% H-UCL	N/A
Log-transformed Statistics		95% Chebyshev (MVUE) UCL	24151
Minimum of log data	10.00333	97.5% Chebyshev (MVUE) UCL	24681.47
Maximum of log data	10.05621	99% Chebyshev (MVUE) UCL	25723.48
Mean of log data	10.03976	95% Non-parametric UCLs	
Standard Deviation of log data	0.024538	CLT UCL	23382.29
Variance of log data	0.000602	Adj-CLT UCL (Adjusted for skewness)	23104.29
RECOMMENDATION		Mod-t UCL (Adjusted for skewness)	23535.9
Data are normal (0.05)		Jackknife UCL	23579.27
Use Student's-t UCL		Standard Bootstrap UCL	N/R
		Bootstrap-t UCL	N/R
		Hall's Bootstrap UCL	N/R
		Percentile Bootstrap UCL	N/R
		BCA Bootstrap UCL	N/R
		95% Chebyshev (Mean, Sd) UCL	24136.83
		97.5% Chebyshev (Mean, Sd) UCL	24661.2
		99% Chebyshev (Mean, Sd) UCL	25691.2

23579.27

Recommended UCL exceeds the maximum observation

Data File P:\10500\_OMEGA\data\RA Data - Oct 2006\ Variable: LEAD

Raw Statistics		Normal Distribution Test	
Number of Valid Samples	44	Shapiro-Wilk Test Statistic	0.284334
Number of Unique Samples	35	Shapiro-Wilk 5% Critical Value	0.944
Minimum	2.5	Data not normal at 5% significance level	
Maximum	890	95% UCL (Assuming Normal Distribution)	
Mean	48.11364	Student's-t UCL	81.60184
Median	21.5	Gamma Distribution Test	
Standard Deviation	132.1394	A-D Test Statistic	3.093067
Variance	17460.82	A-D 5% Critical Value	0.788374
Coefficient of Variation	2.746402	K-S Test Statistic	0.219374
Skewness	6.292421	K-S 5% Critical Value	0.138479
Gamma Statistics		Data do not follow gamma distribution at 5% significance level	
k hat	0.774439	95% UCLs (Assuming Gamma Distribution)	
k star (bias corrected)	0.736788	Approximate Gamma UCL	65.9426
Theta hat	62.12711	Adjusted Gamma UCL	66.65869
Theta star	65.30191	Lognormal Distribution Test	
nu hat	68.1506	Shapiro-Wilk Test Statistic	0.957803
nu star	64.83731	Shapiro-Wilk 5% Critical Value	0.944
Approx.Chi Square Value (.05)	47.30719	Data are lognormal at 5% significance level	
Adjusted Level of Significance	0.044545	95% UCLs (Assuming Lognormal Distribution)	
Adjusted Chi Square Value	46.79898	95% H-UCL	53.68825
Log-transformed Statistics		95% Chebyshev (MVUE) UCL	65.28727
Minimum of log data	0.916291	97.5% Chebyshev (MVUE) UCL	77.68799
Maximum of log data	6.791221	99% Chebyshev (MVUE) UCL	102.0468
Mean of log data	3.103905	95% Non-parametric UCLs	
Standard Deviation of log data	1.013958	CLT UCL	80.88037
Variance of log data	1.028111	Adj-CLT UCL (Adjusted for skewness)	101.0723
RECOMMENDATION		Mod-t UCL (Adjusted for skewness)	84.75137
Data are lognormal (0.05)		Jackknife UCL	81.60184
Use H-UCL		Standard Bootstrap UCL	79.8474
53.68825		Bootstrap-t UCL	200.7991
		Hall's Bootstrap UCL	200.1176
		Percentile Bootstrap UCL	85.99318
		BCA Bootstrap UCL	128.0841
		95% Chebyshev (Mean, Sd) UCL	134.9462
		97.5% Chebyshev (Mean, Sd) UCL	172.5188
		99% Chebyshev (Mean, Sd) UCL	246.3227

Raw Statistics		Normal Distribution Test	
Number of Valid Samples	65	Lilliefors Test Statistic	0.498051
Number of Unique Samples	21	Lilliefors 5% Critical Value	0.109895
Minimum	0.0025	Data not normal at 5% significance level	
Maximum	100	95% UCL (Assuming Normal Distribution)	
Mean	3.262622	Student's-t UCL	6.287738
Median	0.25	Gamma Distribution Test	
Standard Deviation	14.61299	A-D Test Statistic	9.517922
Variance	213.5395	A-D 5% Critical Value	0.927523
Coefficient of Variation	4.47891	K-S Test Statistic	0.357854
Skewness	5.623369	K-S 5% Critical Value	0.123384
Gamma Statistics		Data do not follow gamma distribution at 5% significance level	
k hat	0.177328	95% UCLs (Assuming Gamma Distribution)	
k star (bias corrected)	0.1794	Approximate Gamma UCL	5.707152
Theta hat	18.39884	Adjusted Gamma UCL	5.781628
Theta star	18.18633	Lognormal Distribution Test	
nu hat	23.05259	Lilliefors Test Statistic	0.230846
nu star	23.32196	Lilliefors 5% Critical Value	0.109895
Approx. Chi Square Value (.05)	13.33252	Data not lognormal at 5% significance level	
Adjusted Level of Significance	0.046308	95% UCLs (Assuming Lognormal Distribution)	
Adjusted Chi Square Value	13.16078	95% H-UCL	11.45375
Log-transformed Statistics		95% Chebyshev (MVUE) UCL	6.573399
Minimum of log data	-5.991465	97.5% Chebyshev (MVUE) UCL	8.613529
Maximum of log data	4.60517	99% Chebyshev (MVUE) UCL	12.62097
Mean of log data	-3.045153	95% Non-parametric UCLs	
Standard Deviation of log data	2.801016	CLT UCL	6.243949
Variance of log data	7.845689	Adj-CLT UCL (Adjusted for skewness)	7.594785
RECOMMENDATION		Mod-t UCL (Adjusted for skewness)	6.498441
Data are Non-parametric (0.05)		Jackknife UCL	6.287738
Use 99% Chebyshev (Mean, Sd) UCL		Standard Bootstrap UCL	6.255233
21.29695		Bootstrap-t UCL	15.25427
		Hall's Bootstrap UCL	18.44889
		Percentile Bootstrap UCL	6.49239
		BCA Bootstrap UCL	8.681182
		95% Chebyshev (Mean, Sd) UCL	11.16321
		97.5% Chebyshev (Mean, Sd) UCL	14.58179
		99% Chebyshev (Mean, Sd) UCL	21.29695

Data File P:\10500\_OMEGA\data\RA Data - Oct 2006\ Variable: NAPHTHALENE

<b>Raw Statistics</b>		<b>Normal Distribution Test</b>	
Number of Valid Samples	60	Lilliefors Test Statistic	0.419817
Number of Unique Samples	26	Lilliefors 5% Critical Value	0.114382
Minimum	0.002	Data not normal at 5% significance level	
Maximum	4	95% UCL (Assuming Normal Distribution)	
Mean	0.341438	Student's-t UCL	0.5149
Median	0.1	<b>Gamma Distribution Test</b>	
Standard Deviation	0.804046	A-D Test Statistic	4.364722
Variance	0.64649	A-D 5% Critical Value	0.839641
Coefficient of Variation	2.354885	K-S Test Statistic	0.262376
Skewness	3.346329	K-S 5% Critical Value	0.122906
<b>Gamma Statistics</b>		Data do not follow gamma distribution at 5% significance level	
k hat	0.399911	95% UCLs (Assuming Gamma Distribution)	
k star (bias corrected)	0.391026	Approximate Gamma UCL	0.497537
Theta hat	0.853784	Adjusted Gamma UCL	0.502223
Theta star	0.873183	<b>Lognormal Distribution Test</b>	
nu hat	47.98928	Lilliefors Test Statistic	0.187677
nu star	46.92315	Lilliefors 5% Critical Value	0.114382
Approx.Chi Square Value (.05)	32.20124	Data not lognormal at 5% significance level	
Adjusted Level of Significance	0.046	95% UCLs (Assuming Lognormal Distribution)	
Adjusted Chi Square Value	31.90083	95% H-UCL	0.941969
<b>Log-transformed Statistics</b>		95% Chebyshev (MVUE) UCL	0.976295
Minimum of log data	-6.214608	97.5% Chebyshev (MVUE) UCL	1.235179
Maximum of log data	1.386294	99% Chebyshev (MVUE) UCL	1.743706
Mean of log data	-2.720111	<b>95% Non-parametric UCLs</b>	
Standard Deviation of log data	1.911519	CLT UCL	0.512176
Variance of log data	3.653903	Adj-CLT UCL (Adjusted for skewness)	0.560092
<b>RECOMMENDATION</b>		Mod-t UCL (Adjusted for skewness)	0.522374
Data are Non-parametric (0.05)		Jackknife UCL	0.5149
Use 97.5% Chebyshev (Mean, Sd) UCL		Standard Bootstrap UCL	0.507667
0.98968		Bootstrap-t UCL	0.632358
		Hall's Bootstrap UCL	0.555105
		Percentile Bootstrap UCL	0.516774
		BCA Bootstrap UCL	0.648994
		95% Chebyshev (Mean, Sd) UCL	0.7939
		97.5% Chebyshev (Mean, Sd) UCL	0.98968
		99% Chebyshev (Mean, Sd) UCL	1.374253

Data File P:\10500\_OMEGA\data\RA Data - Oct 2006\ Variable: PCB-1254 (AROCLOR 1254)

Raw Statistics		Normal Distribution Test	
Number of Valid Samples	43	Shapiro-Wilk Test Statistic	0.288316
Number of Unique Samples	9	Shapiro-Wilk 5% Critical Value	0.943
Minimum	0.005	Data not normal at 5% significance level	
Maximum	0.5	95% UCL (Assuming Normal Distribution)	
Mean	0.028221	Student's-t UCL	0.048742
Median	0.015	Gamma Distribution Test	
Standard Deviation	0.080006	A-D Test Statistic	7.081433
Variance	0.006401	A-D 5% Critical Value	0.792761
Coefficient of Variation	2.834998	K-S Test Statistic	0.39285
Skewness	5.401464	K-S 5% Critical Value	0.140528
Gamma Statistics		Data do not follow gamma distribution at 5% significance level	
k hat	0.715389	95% UCLs (Assuming Gamma Distribution)	
k star (bias corrected)	0.680982	Approximate Gamma UCL	0.039382
Theta hat	0.039448	Adjusted Gamma UCL	0.039846
Theta star	0.041442	Lognormal Distribution Test	
nu hat	61.52341	Shapiro-Wilk Test Statistic	0.743529
nu star	58.56441	Shapiro-Wilk 5% Critical Value	0.943
Approx. Chi Square Value (.05)	41.96699	Data not lognormal at 5% significance level	
Adjusted Level of Significance	0.044419	95% UCLs (Assuming Lognormal Distribution)	
Adjusted Chi Square Value	41.47839	95% H-UCL	0.026036
Log-transformed Statistics		95% Chebyshev (MVUE) UCL	0.031675
Minimum of log data	-5.298317	97.5% Chebyshev (MVUE) UCL	0.037376
Maximum of log data	-0.693147	99% Chebyshev (MVUE) UCL	0.048576
Mean of log data	-4.40992	95% Non-parametric UCLs	
Standard Deviation of log data	0.93155	CLT UCL	0.04829
Variance of log data	0.867786	Adj-CLT UCL (Adjusted for skewness)	0.059028
RECOMMENDATION		Mod-t UCL (Adjusted for skewness)	0.050417
Data are Non-parametric (0.05)		Jackknife UCL	0.048742
Use 95% Chebyshev (Mean, Sd) UCL		Standard Bootstrap UCL	0.048128
0.081403		Bootstrap-t UCL	0.194633
		Hall's Bootstrap UCL	0.14228
		Percentile Bootstrap UCL	0.051547
		BCA Bootstrap UCL	0.067953
		95% Chebyshev (Mean, Sd) UCL	0.081403
		97.5% Chebyshev (Mean, Sd) UCL	0.104415
		99% Chebyshev (Mean, Sd) UCL	0.149618

Raw Statistics		Normal Distribution Test	
Number of Valid Samples	41	Shapiro-Wilk Test Statistic	0.496187
Number of Unique Samples	12	Shapiro-Wilk 5% Critical Value	0.941
Minimum	0.013	Data not normal at 5% significance level	
Maximum	5	95% UCL (Assuming Normal Distribution)	
Mean	0.556	Student's-t UCL	0.866092
Median	0.1	Gamma Distribution Test	
Standard Deviation	1.179176	A-D Test Statistic	6.23876
Variance	1.390455	A-D 5% Critical Value	0.821845
Coefficient of Variation	2.12082	K-S Test Statistic	0.407377
Skewness	2.628345	K-S 5% Critical Value	0.146653
Gamma Statistics		Data do not follow gamma distribution at 5% significance level	
k hat	0.461783	95% UCLs (Assuming Gamma Distribution)	
k star (bias corrected)	0.444254	Approximate Gamma UCL	0.857807
Theta hat	1.204028	Adjusted Gamma UCL	0.871751
Theta star	1.251536	Lognormal Distribution Test	
nu hat	37.86622	Shapiro-Wilk Test Statistic	0.805988
nu star	36.42885	Shapiro-Wilk 5% Critical Value	0.941
Approx. Chi Square Value (.05)	23.61189	Data not lognormal at 5% significance level	
Adjusted Level of Significance	0.044146	95% UCLs (Assuming Lognormal Distribution)	
Adjusted Chi Square Value	23.2342	95% H-UCL	0.801145
Log-transformed Statistics		95% Chebyshev (MVUE) UCL	0.883877
Minimum of log data	-4.342806	97.5% Chebyshev (MVUE) UCL	1.099643
Maximum of log data	1.609438	99% Chebyshev (MVUE) UCL	1.523473
Mean of log data	-1.9797	95% Non-parametric UCLs	
Standard Deviation of log data	1.4675	CLT UCL	0.85891
Variance of log data	2.153556	Adj-CLT UCL (Adjusted for skewness)	0.939682
RECOMMENDATION		Mod-t UCL (Adjusted for skewness)	0.87869
Data are Non-parametric (0.05)		Jackknife UCL	0.866092
Use 99% Chebyshev (Mean, Sd) UCL		Standard Bootstrap UCL	0.850288
		Bootstrap-t UCL	1.02236
		Hall's Bootstrap UCL	0.888994
		Percentile Bootstrap UCL	0.851854
		BCA Bootstrap UCL	1.042585
		95% Chebyshev (Mean, Sd) UCL	1.358719
		97.5% Chebyshev (Mean, Sd) UCL	1.706056
		99% Chebyshev (Mean, Sd) UCL	2.388332

2.388332

Raw Statistics		Normal Distribution Test	
Number of Valid Samples	66	Lilliefors Test Statistic	0.498441
Number of Unique Samples	55	Lilliefors 5% Critical Value	0.109059
Minimum	0.0025	Data not normal at 5% significance level	
Maximum	1300	95% UCL (Assuming Normal Distribution)	
Mean	51.60672	Student's-t UCL	96.19022
Median	1.25	Gamma Distribution Test	
Standard Deviation	217.0624	A-D Test Statistic	8.745748
Variance	47116.08	A-D 5% Critical Value	0.917619
Coefficient of Variation	4.206087	K-S Test Statistic	0.337588
Skewness	4.95795	K-S 5% Critical Value	0.121991
Gamma Statistics		Data do not follow gamma distribution at 5% significance level	
k hat	0.190046	95% UCLs (Assuming Gamma Distribution)	
k star (bias corrected)	0.191508	Approximate Gamma UCL	88.00613
Theta hat	271.5491	Adjusted Gamma UCL	89.08296
Theta star	269.4753	Lognormal Distribution Test	
nu hat	25.08602	Lilliefors Test Statistic	0.111272
nu star	25.27908	Lilliefors 5% Critical Value	0.109059
Approx. Chi Square Value (.05)	14.82363	Data not lognormal at 5% significance level	
Adjusted Level of Significance	0.046364	95% UCLs (Assuming Lognormal Distribution)	
Adjusted Chi Square Value	14.64444	95% H-UCL	143.4172
Log-transformed Statistics		95% Chebyshev (MVUE) UCL	95.34533
Minimum of log data	-5.991465	97.5% Chebyshev (MVUE) UCL	124.3276
Maximum of log data	7.17012	99% Chebyshev (MVUE) UCL	181.2576
Mean of log data	0.040518	95% Non-parametric UCLs	
Standard Deviation of log data	2.652033	CLT UCL	95.5548
Variance of log data	7.033277	Adj-CLT UCL (Adjusted for skewness)	112.9778
RECOMMENDATION		Mod-t UCL (Adjusted for skewness)	98.90785
Data are Non-parametric (0.05)		Jackknife UCL	96.19022
Use 99% Chebyshev (Mean, Sd) UCL		Standard Bootstrap UCL	94.11441
		Bootstrap-t UCL	195.84
		Hall's Bootstrap UCL	138.1758
		Percentile Bootstrap UCL	98.17552
		BCA Bootstrap UCL	136.0753
		95% Chebyshev (Mean, Sd) UCL	168.0701
		97.5% Chebyshev (Mean, Sd) UCL	218.4639
		99% Chebyshev (Mean, Sd) UCL	317.4528

317.4528

Raw Statistics		Normal Distribution Test	
Number of Valid Samples	65	Lilliefors Test Statistic	0.495988
Number of Unique Samples	22	Lilliefors 5% Critical Value	0.109895
Minimum	0.000415	Data not normal at 5% significance level	
Maximum	62	95% UCL (Assuming Normal Distribution)	
Mean	2.132616	Student's-t UCL	3.971536
Median	0.0425	Gamma Distribution Test	
Standard Deviation	8.883002	A-D Test Statistic	7.511138
Variance	78.90772	A-D 5% Critical Value	0.933125
Coefficient of Variation	4.165308	K-S Test Statistic	0.354941
Skewness	5.523	K-S 5% Critical Value	0.123649
Gamma Statistics		Data do not follow gamma distribution at 5% significance level	
k hat	0.170167	95% UCLs (Assuming Gamma Distribution)	
k star (bias corrected)	0.172569	Approximate Gamma UCL	3.778318
Theta hat	12.53252	Adjusted Gamma UCL	3.828796
Theta star	12.35804	Lognormal Distribution Test	
nu hat	22.12165	Lilliefors Test Statistic	0.22651
nu star	22.43399	Lilliefors 5% Critical Value	0.109895
Approx. Chi Square Value (.05)	12.66253	Data not lognormal at 5% significance level	
Adjusted Level of Significance	0.046308	95% UCLs (Assuming Lognormal Distribution)	
Adjusted Chi Square Value	12.49559	95% H-UCL	31.75602
Log-transformed Statistics		95% Chebyshev (MVUE) UCL	11.37993
Minimum of log data	-7.787232	97.5% Chebyshev (MVUE) UCL	15.05979
Maximum of log data	4.127134	99% Chebyshev (MVUE) UCL	22.28818
Mean of log data	-3.675791	95% Non-parametric UCLs	
Standard Deviation of log data	3.205584	CLT UCL	3.944917
Variance of log data	10.27577	Adj-CLT UCL (Adjusted for skewness)	4.751412
RECOMMENDATION		Mod-t UCL (Adjusted for skewness)	4.097332
Data are Non-parametric (0.05)		Jackknife UCL	3.971536
Use 99% Chebyshev (Mean, Sd) UCL		Standard Bootstrap UCL	4.025897
		Bootstrap-t UCL	6.825048
		Hall's Bootstrap UCL	5.447479
		Percentile Bootstrap UCL	4.111591
		BCA Bootstrap UCL	5.414722
		95% Chebyshev (Mean, Sd) UCL	6.935254
		97.5% Chebyshev (Mean, Sd) UCL	9.01336
		99% Chebyshev (Mean, Sd) UCL	13.0954

Raw Statistics		Normal Distribution Test	
Number of Valid Samples	66	Lilliefors Test Statistic	0.49782
Number of Unique Samples	32	Lilliefors 5% Critical Value	0.109059
Minimum	0.0025	Data not normal at 5% significance level	
Maximum	140	95% UCL (Assuming Normal Distribution)	
Mean	4.404461	Student's-t UCL	8.727938
Median	0.125	Gamma Distribution Test	
Standard Deviation	21.04959	A-D Test Statistic	10.97743
Variance	443.0852	A-D 5% Critical Value	0.924334
Coefficient of Variation	4.779153	K-S Test Statistic	0.437835
Skewness	5.644332	K-S 5% Critical Value	0.122306
Gamma Statistics		Data do not follow gamma distribution at 5% significance level	
k hat	0.181545	95% UCLs (Assuming Gamma Distribution)	
k star (bias corrected)	0.183394	Approximate Gamma UCL	7.613106
Theta hat	24.26102	Adjusted Gamma UCL	7.708714
Theta star	24.01642	Lognormal Distribution Test	
nu hat	23.96391	Lilliefors Test Statistic	0.21811
nu star	24.20797	Lilliefors 5% Critical Value	0.109059
Approx. Chi Square Value (.05)	14.0052	Data not lognormal at 5% significance level	
Adjusted Level of Significance	0.046364	95% UCLs (Assuming Lognormal Distribution)	
Adjusted Chi Square Value	13.8315	95% H-UCL	5.796987
Log-transformed Statistics		95% Chebyshev (MVUE) UCL	4.369727
Minimum of log data	-5.991465	97.5% Chebyshev (MVUE) UCL	5.667519
Maximum of log data	4.941642	99% Chebyshev (MVUE) UCL	8.21678
Mean of log data	-2.632098	95% Non-parametric UCLs	
Standard Deviation of log data	2.498436	CLT UCL	8.666318
Variance of log data	6.242181	Adj-CLT UCL (Adjusted for skewness)	10.58982
RECOMMENDATION		Mod-t UCL (Adjusted for skewness)	9.027965
Data are Non-parametric (0.05)		Jackknife UCL	8.727938
Use 99% Chebyshev (Mean, Sd) UCL		Standard Bootstrap UCL	8.670098
		Bootstrap-t UCL	31.0795
		Hall's Bootstrap UCL	34.78054
		Percentile Bootstrap UCL	9.452285
		BCA Bootstrap UCL	12.79722
		95% Chebyshev (Mean, Sd) UCL	15.69848
		97.5% Chebyshev (Mean, Sd) UCL	20.58541
		99% Chebyshev (Mean, Sd) UCL	30.18484

30.18484

Raw Statistics		Normal Distribution Test	
Number of Valid Samples	66	Lilliefors Test Statistic	0.496375
Number of Unique Samples	27	Lilliefors 5% Critical Value	0.109059
Minimum	0.002	Data not normal at 5% significance level	
Maximum	220	95% UCL (Assuming Normal Distribution)	
Mean	6.552703	Student's-t UCL	13.3907
Median	0.0755	Gamma Distribution Test	
Standard Deviation	33.29198	A-D Test Statistic	11.17501
Variance	1108.356	A-D 5% Critical Value	0.944546
Coefficient of Variation	5.080648	K-S Test Statistic	0.411351
Skewness	5.730696	K-S 5% Critical Value	0.123253
Gamma Statistics		Data do not follow gamma distribution at 5% significance level	
k hat	0.155958	95% UCLs (Assuming Gamma Distribution)	
k star (bias corrected)	0.15897	Approximate Gamma UCL	11.87597
Theta hat	42.01579	Adjusted Gamma UCL	12.03862
Theta star	41.21972	Lognormal Distribution Test	
nu hat	20.58647	Lilliefors Test Statistic	0.188151
nu star	20.98405	Lilliefors 5% Critical Value	0.109059
Approx.Chi Square Value (.05)	11.5782	Data not lognormal at 5% significance level	
Adjusted Level of Significance	0.046364	95% UCLs (Assuming Lognormal Distribution)	
Adjusted Chi Square Value	11.42177	95% H-UCL	12.74071
Log-transformed Statistics		95% Chebyshev (MVUE) UCL	7.225734
Minimum of log data	-6.214608	97.5% Chebyshev (MVUE) UCL	9.47223
Maximum of log data	5.393628	99% Chebyshev (MVUE) UCL	13.88504
Mean of log data	-3.020272	95% Non-parametric UCLs	
Standard Deviation of log data	2.825708	CLT UCL	13.29325
Variance of log data	7.984628	Adj-CLT UCL (Adjusted for skewness)	16.382
RECOMMENDATION		Mod-t UCL (Adjusted for skewness)	13.87249
Data are Non-parametric (0.05)		Jackknife UCL	13.3907
Use 99% Chebyshev (Mean, Sd) UCL		Standard Bootstrap UCL	13.18345
		Bootstrap-t UCL	70.71759
		Hall's Bootstrap UCL	76.49448
		Percentile Bootstrap UCL	14.28117
		BCA Bootstrap UCL	19.45083
		95% Chebyshev (Mean, Sd) UCL	24.41529
		97.5% Chebyshev (Mean, Sd) UCL	32.14445
		99% Chebyshev (Mean, Sd) UCL	47.32688

47.32688

## **A-1.3 Indoor Air - Site Parcel**

<b>Raw Statistics</b>		<b>Normal Distribution Test</b>	
Number of Valid Samples	8	Shapiro-Wilk Test Statistic	0.536826
Number of Unique Samples	8	Shapiro-Wilk 5% Critical Value	0.818
Minimum	0.0185	Data not normal at 5% significance level	
Maximum	1.7	95% UCL (Assuming Normal Distribution)	
Mean	0.290938	Student's-t UCL	0.679519
Median	0.053	<b>Gamma Distribution Test</b>	
Standard Deviation	0.580116	A-D Test Statistic	1.14442
Variance	0.336535	A-D 5% Critical Value	0.760994
Coefficient of Variation	1.993955	K-S Test Statistic	0.396047
Skewness	2.64132	K-S 5% Critical Value	0.308597
<b>Gamma Statistics</b>		Data do not follow gamma distribution at 5% significance level	
k hat	0.519952	95% UCLs (Assuming Gamma Distribution)	
k star (bias corrected)	0.408303	Approximate Gamma UCL	0.991261
Theta hat	0.559547	Adjusted Gamma UCL	1.406485
Theta star	0.712553	<b>Lognormal Distribution Test</b>	
nu hat	8.319224	Shapiro-Wilk Test Statistic	0.829154
nu star	6.532849	Shapiro-Wilk 5% Critical Value	0.818
Approx. Chi Square Value (.05)	1.917406	Data are lognormal at 5% significance level	
Adjusted Level of Significance	0.01946	95% UCLs (Assuming Lognormal Distribution)	
Adjusted Chi Square Value	1.351348	95% H-UCL	3.633228
<b>Log-transformed Statistics</b>		95% Chebyshev (MVUE) UCL	0.674406
Minimum of log data	-3.989985	97.5% Chebyshev (MVUE) UCL	0.877414
Maximum of log data	0.530628	99% Chebyshev (MVUE) UCL	1.276184
Mean of log data	-2.448906	<b>95% Non-parametric UCLs</b>	
Standard Deviation of log data	1.471334	CLT UCL	0.6283
Variance of log data	2.164824	Adj-CLT UCL (Adjusted for skewness)	0.832957
<b>RECOMMENDATION</b>		Mod-t UCL (Adjusted for skewness)	0.711442
Data are lognormal (0.05)		Jackknife UCL	0.679519
Use 95% Chebyshev (MVUE) UCL		Standard Bootstrap UCL	0.599471
0.674406		Bootstrap-t UCL	9.889703
		Hall's Bootstrap UCL	4.747617
		Percentile Bootstrap UCL	0.669313
		BCA Bootstrap UCL	0.912813
		95% Chebyshev (Mean, Sd) UCL	1.184957
		97.5% Chebyshev (Mean, Sd) UCL	1.5718
		99% Chebyshev (Mean, Sd) UCL	2.331677

<b>Raw Statistics</b>		<b>Normal Distribution Test</b>	
Number of Valid Samples	8	Shapiro-Wilk Test Statistic	0.841156
Number of Unique Samples	8	Shapiro-Wilk 5% Critical Value	0.818
Minimum	0.21	Data are normal at 5% significance level	
Maximum	3.85	95% UCL (Assuming Normal Distribution)	
Mean	1.34125	Student's-t UCL	2.162551
Median	0.8	<b>Gamma Distribution Test</b>	
Standard Deviation	1.226126	A-D Test Statistic	0.282876
Variance	1.503384	A-D 5% Critical Value	0.728235
Coefficient of Variation	0.914166	K-S Test Statistic	0.201375
Skewness	1.434011	K-S 5% Critical Value	0.29884
<b>Gamma Statistics</b>		Data follow gamma distribution at 5% significance level	
k hat	1.520751	95% UCLs (Assuming Gamma Distribution)	
k star (bias corrected)	1.033802	Approximate Gamma UCL	2.658911
Theta hat	0.881966	Adjusted Gamma UCL	3.204433
Theta star	1.297395	<b>Lognormal Distribution Test</b>	
nu hat	24.33201	Shapiro-Wilk Test Statistic	0.973422
nu star	16.54084	Shapiro-Wilk 5% Critical Value	0.818
Approx.Chi Square Value (.05)	8.343793	Data are lognormal at 5% significance level	
Adjusted Level of Significance	0.01946	95% UCLs (Assuming Lognormal Distribution)	
Adjusted Chi Square Value	6.923346	95% H-UCL	4.672102
<b>Log-transformed Statistics</b>		95% Chebyshev (MVUE) UCL	3.32161
Minimum of log data	-1.560648	97.5% Chebyshev (MVUE) UCL	4.176706
Maximum of log data	1.348073	99% Chebyshev (MVUE) UCL	5.856378
Mean of log data	-0.069891	<b>95% Non-parametric UCLs</b>	
Standard Deviation of log data	0.933716	CLT UCL	2.054295
Variance of log data	0.871826	Adj-CLT UCL (Adjusted for skewness)	2.289139
<b>RECOMMENDATION</b>		Mod-t UCL (Adjusted for skewness)	2.199182
Data are normal (0.05)		Jackknife UCL	2.162551
Use Student's-t UCL		Standard Bootstrap UCL	2.005831
2.162551		Bootstrap-t UCL	3.009588
		Hall's Bootstrap UCL	2.858334
		Percentile Bootstrap UCL	2.01625
		BCA Bootstrap UCL	2.47875
		95% Chebyshev (Mean, Sd) UCL	3.230836
		97.5% Chebyshev (Mean, Sd) UCL	4.048462
		99% Chebyshev (Mean, Sd) UCL	5.654529

<b>Raw Statistics</b>		<b>Normal Distribution Test</b>	
Number of Valid Samples	8	Shapiro-Wilk Test Statistic	0.832905
Number of Unique Samples	8	Shapiro-Wilk 5% Critical Value	0.818
Minimum	0.17	Data are normal at 5% significance level	
Maximum	4.25	95% UCL (Assuming Normal Distribution)	
Mean	1.7425	Student's-t UCL	2.836502
Median	1.025	<b>Gamma Distribution Test</b>	
Standard Deviation	1.633242	A-D Test Statistic	0.275692
Variance	2.667479	A-D 5% Critical Value	0.732868
Coefficient of Variation	0.937298	K-S Test Statistic	0.165059
Skewness	0.901945	K-S 5% Critical Value	0.300508
<b>Gamma Statistics</b>		Data follow gamma distribution at 5% significance level	
k hat	1.185846	95% UCLs (Assuming Gamma Distribution)	
k star (bias corrected)	0.824487	Approximate Gamma UCL	3.817869
Theta hat	1.469415	Adjusted Gamma UCL	4.738245
Theta star	2.113435	<b>Lognormal Distribution Test</b>	
nu hat	18.97354	Shapiro-Wilk Test Statistic	0.954054
nu star	13.1918	Shapiro-Wilk 5% Critical Value	0.818
Approx. Chi Square Value (.05)	6.020821	Data are lognormal at 5% significance level	
Adjusted Level of Significance	0.01946	95% UCLs (Assuming Lognormal Distribution)	
Adjusted Chi Square Value	4.851312	95% H-UCL	10.5247
<b>Log-transformed Statistics</b>		95% Chebyshev (MVUE) UCL	5.08498
Minimum of log data	-1.771957	97.5% Chebyshev (MVUE) UCL	6.492689
Maximum of log data	1.446919	99% Chebyshev (MVUE) UCL	9.257862
Mean of log data	0.077737	<b>95% Non-parametric UCLs</b>	
Standard Deviation of log data	1.129431	CLT UCL	2.692301
Variance of log data	1.275615	Adj-CLT UCL (Adjusted for skewness)	2.889054
<b>RECOMMENDATION</b>		Mod-t UCL (Adjusted for skewness)	2.867191
Data are normal (0.05)		Jackknife UCL	2.836502
Use Student's-t UCL		Standard Bootstrap UCL	2.631247
2.836502		Bootstrap-t UCL	3.818513
		Hall's Bootstrap UCL	3.042623
		Percentile Bootstrap UCL	2.715
		BCA Bootstrap UCL	2.49
		95% Chebyshev (Mean, Sd) UCL	4.259495
		97.5% Chebyshev (Mean, Sd) UCL	5.3486
		99% Chebyshev (Mean, Sd) UCL	7.487937

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Raw Statistics		Normal Distribution Test	
Number of Valid Samples	8	Shapiro-Wilk Test Statistic	0.677628
Number of Unique Samples	8	Shapiro-Wilk 5% Critical Value	0.818
Minimum	10	Data not normal at 5% significance level	
Maximum	2500	95% UCL (Assuming Normal Distribution)	
Mean	672.875	Student's-t UCL	1376.327
Median	83	Gamma Distribution Test	
Standard Deviation	1050.187	A-D Test Statistic	0.678201
Variance	1102893	A-D 5% Critical Value	0.786818
Coefficient of Variation	1.560746	K-S Test Statistic	0.277333
Skewness	1.375672	K-S 5% Critical Value	0.314568
Gamma Statistics		Data follow gamma distribution at 5% significance level	
k hat	0.359856	95% UCLs (Assuming Gamma Distribution)	
k star (bias corrected)	0.308243	Approximate Gamma UCL	2961.788
Theta hat	1869.847	Adjusted Gamma UCL	4539.619
Theta star	2182.936	Lognormal Distribution Test	
nu hat	5.757689	Shapiro-Wilk Test Statistic	0.848522
nu star	4.931889	Shapiro-Wilk 5% Critical Value	0.818
Approx. Chi Square Value (.05)	1.120453	Data are lognormal at 5% significance level	
Adjusted Level of Significance	0.01946	95% UCLs (Assuming Lognormal Distribution)	
Adjusted Chi Square Value	0.731018	95% H-UCL	1024337
Log-transformed Statistics		95% Chebyshev (MVUE) UCL	3257.403
Minimum of log data	2.302585	97.5% Chebyshev (MVUE) UCL	4339.514
Maximum of log data	7.824046	99% Chebyshev (MVUE) UCL	6465.113
Mean of log data	4.651355	95% Non-parametric UCLs	
Standard Deviation of log data	2.340005	CLT UCL	1283.604
Variance of log data	5.475622	Adj-CLT UCL (Adjusted for skewness)	1476.567
RECOMMENDATION		Mod-t UCL (Adjusted for skewness)	1406.425
Data follow gamma distribution (0.05)		Jackknife UCL	1376.327
Use Adjusted Gamma UCL		Standard Bootstrap UCL	1262.334
Recommender 4539.619		Bootstrap-t UCL	4323.387
		Hall's Bootstrap UCL	5811.855
		Percentile Bootstrap UCL	1257
		BCA Bootstrap UCL	1567.125
		95% Chebyshev (Mean, Sd) UCL	2291.322
		97.5% Chebyshev (Mean, Sd) UCL	2991.625
		99% Chebyshev (Mean, Sd) UCL	4367.235

Raw Statistics		Normal Distribution Test	
Number of Valid Samples	8	Shapiro-Wilk Test Statistic	0.80658
Number of Unique Samples	7	Shapiro-Wilk 5% Critical Value	0.818
Minimum	0.88	Data not normal at 5% significance level	
Maximum	4.2	95% UCL (Assuming Normal Distribution)	
Mean	1.921875	Student's-t UCL	2.764856
Median	1.6	Gamma Distribution Test	
Standard Deviation	1.258491	A-D Test Statistic	0.576316
Variance	1.5838	A-D 5% Critical Value	0.721154
Coefficient of Variation	0.654825	K-S Test Statistic	0.219317
Skewness	1.185372	K-S 5% Critical Value	0.296194
Gamma Statistics		Data follow gamma distribution at 5% significance level	
k hat	3.108962	95% UCLs (Assuming Gamma Distribution)	
k star (bias corrected)	2.026435	Approximate Gamma UCL	3.053711
Theta hat	0.618173	Adjusted Gamma UCL	3.455312
Theta star	0.948402	Lognormal Distribution Test	
nu hat	49.74339	Shapiro-Wilk Test Statistic	0.86917
nu star	32.42295	Shapiro-Wilk 5% Critical Value	0.818
Approx. Chi Square Value (.05)	20.40562	Data are lognormal at 5% significance level	
Adjusted Level of Significance	0.01946	95% UCLs (Assuming Lognormal Distribution)	
Adjusted Chi Square Value	18.03393	95% H-UCL	3.532686
Log-transformed Statistics		95% Chebyshev (MVUE) UCL	3.704943
Minimum of log data	-0.127833	97.5% Chebyshev (MVUE) UCL	4.48537
Maximum of log data	1.435085	99% Chebyshev (MVUE) UCL	6.018369
Mean of log data	0.483939	95% Non-parametric UCLs	
Standard Deviation of log data	0.607377	CLT UCL	2.653742
Variance of log data	0.368907	Adj-CLT UCL (Adjusted for skewness)	2.852991
RECOMMENDATION		Mod-t UCL (Adjusted for skewness)	2.795935
Data follow gamma distribution (0.05)		Jackknife UCL	2.764856
Use Approximate Gamma UCL		Standard Bootstrap UCL	2.601541
		Bootstrap-t UCL	3.914061
		Hall's Bootstrap UCL	8.069388
		Percentile Bootstrap UCL	2.66125
		BCA Bootstrap UCL	2.5475
		95% Chebyshev (Mean, Sd) UCL	3.86134
		97.5% Chebyshev (Mean, Sd) UCL	4.700548
		99% Chebyshev (Mean, Sd) UCL	6.349009

3.053711

Raw Statistics		Normal Distribution Test	
Number of Valid Samples	8	Shapiro-Wilk Test Statistic	0.522443
Number of Unique Samples	7	Shapiro-Wilk 5% Critical Value	0.818
Minimum	0.065	Data not normal at 5% significance level	
Maximum	1.7	95% UCL (Assuming Normal Distribution)	
Mean	0.3255	Student's-t UCL	0.702913
Median	0.096	Gamma Distribution Test	
Standard Deviation	0.563443	A-D Test Statistic	1.473911
Variance	0.317468	A-D 5% Critical Value	0.743416
Coefficient of Variation	1.731007	K-S Test Statistic	0.423596
Skewness	2.681767	K-S 5% Critical Value	0.303597
Gamma Statistics		Data do not follow gamma distribution at 5% significance level	
k hat	0.794507	95% UCLs (Assuming Gamma Distribution)	
k star (bias corrected)	0.5799	Approximate Gamma UCL	0.864077
Theta hat	0.409688	Adjusted Gamma UCL	1.135918
Theta star	0.561303	Lognormal Distribution Test	
nu hat	12.71211	Shapiro-Wilk Test Statistic	0.710183
nu star	9.278403	Shapiro-Wilk 5% Critical Value	0.818
Approx. Chi Square Value (.05)	3.4952	Data not lognormal at 5% significance level	
Adjusted Level of Significance	0.01946	95% UCLs (Assuming Lognormal Distribution)	
Adjusted Chi Square Value	2.658749	95% H-UCL	1.32025
Log-transformed Statistics		95% Chebyshev (MVUE) UCL	0.689383
Minimum of log data	-2.733368	97.5% Chebyshev (MVUE) UCL	0.878081
Maximum of log data	0.530628	99% Chebyshev (MVUE) UCL	1.248741
Mean of log data	-1.870066	95% Non-parametric UCLs	
Standard Deviation of log data	1.094402	CLT UCL	0.653167
Variance of log data	1.197715	Adj-CLT UCL (Adjusted for skewness)	0.854985
RECOMMENDATION		Mod-t UCL (Adjusted for skewness)	0.734393
Data are Non-parametric (0.05)		Jackknife UCL	0.702913
Use 99% Chebyshev (Mean, Sd) UCL		Standard Bootstrap UCL	0.621824
Recommen 2.307586		Bootstrap-t UCL	10.65327
		Hall's Bootstrap UCL	6.75975
		Percentile Bootstrap UCL	0.69625
		BCA Bootstrap UCL	0.927
		95% Chebyshev (Mean, Sd) UCL	1.193824
		97.5% Chebyshev (Mean, Sd) UCL	1.569548
		99% Chebyshev (Mean, Sd) UCL	2.307586

Raw Statistics		Normal Distribution Test	
Number of Valid Samples	8	Shapiro-Wilk Test Statistic	0.53989
Number of Unique Samples	8	Shapiro-Wilk 5% Critical Value	0.818
Minimum	0.0165	Data not normal at 5% significance level	
Maximum	1.7	95% UCL (Assuming Normal Distribution)	
Mean	0.287063	Student's-t UCL	0.676939
Median	0.0485	Gamma Distribution Test	
Standard Deviation	0.582049	A-D Test Statistic	1.031405
Variance	0.338781	A-D 5% Critical Value	0.765622
Coefficient of Variation	2.027605	K-S Test Statistic	0.374879
Skewness	2.635837	K-S 5% Critical Value	0.309732
Gamma Statistics		Data do not follow gamma distribution at 5% significance level	
k hat	0.481359	95% UCLs (Assuming Gamma Distribution)	
k star (bias corrected)	0.384183	Approximate Gamma UCL	1.028958
Theta hat	0.596358	Adjusted Gamma UCL	1.482811
Theta star	0.747203	Lognormal Distribution Test	
nu hat	7.701747	Shapiro-Wilk Test Statistic	0.851668
nu star	6.146925	Shapiro-Wilk 5% Critical Value	0.818
Approx. Chi Square Value (.05)	1.714892	Data are lognormal at 5% significance level	
Adjusted Level of Significance	0.01946	95% UCLs (Assuming Lognormal Distribution)	
Adjusted Chi Square Value	1.190004	95% H-UCL	5.258663
Log-transformed Statistics		95% Chebyshev (MVUE) UCL	0.691321
Minimum of log data	-4.104395	97.5% Chebyshev (MVUE) UCL	0.9031
Maximum of log data	0.530628	99% Chebyshev (MVUE) UCL	1.319098
Mean of log data	-2.575446	95% Non-parametric UCLs	
Standard Deviation of log data	1.570486	CLT UCL	0.62555
Variance of log data	2.466427	Adj-CLT UCL (Adjusted for skewness)	0.830462
RECOMMENDATION		Mod-t UCL (Adjusted for skewness)	0.708902
Data are lognormal (0.05)		Jackknife UCL	0.676939
Use 99% Chebyshev (MVUE) UCL		Standard Bootstrap UCL	0.608283
1.319098		Bootstrap-t UCL	8.703829
		Hall's Bootstrap UCL	3.954548
		Percentile Bootstrap UCL	0.66225
		BCA Bootstrap UCL	0.907188
		95% Chebyshev (Mean, Sd) UCL	1.184061
		97.5% Chebyshev (Mean, Sd) UCL	1.572193
		99% Chebyshev (Mean, Sd) UCL	2.334602

Raw Statistics		Normal Distribution Test	
Number of Valid Samples	8	Shapiro-Wilk Test Statistic	0.652515
Number of Unique Samples	8	Shapiro-Wilk 5% Critical Value	0.818
Minimum	0.28	Data not normal at 5% significance level	
Maximum	1.7	95% UCL (Assuming Normal Distribution)	
Mean	0.614375	Student's-t UCL	0.91687
Median	0.5025	Gamma Distribution Test	
Standard Deviation	0.451596	A-D Test Statistic	0.803231
Variance	0.203939	A-D 5% Critical Value	0.720275
Coefficient of Variation	0.735049	K-S Test Statistic	0.296415
Skewness	2.510509	K-S 5% Critical Value	0.2959
Gamma Statistics		Data do not follow gamma distribution at 5% significance level	
k hat	3.411926	95% UCLs (Assuming Gamma Distribution)	
k star (bias corrected)	2.215787	Approximate Gamma UCL	0.954217
Theta hat	0.180067	Adjusted Gamma UCL	1.072886
Theta star	0.277272	Lognormal Distribution Test	
nu hat	54.59082	Shapiro-Wilk Test Statistic	0.857176
nu star	35.4526	Shapiro-Wilk 5% Critical Value	0.818
Approx. Chi Square Value (.05)	22.82623	Data are lognormal at 5% significance level	
Adjusted Level of Significance	0.01946	95% UCLs (Assuming Lognormal Distribution)	
Adjusted Chi Square Value	20.30149	95% H-UCL	0.999078
Log-transformed Statistics		95% Chebyshev (MVUE) UCL	1.094744
Minimum of log data	-1.272966	97.5% Chebyshev (MVUE) UCL	1.310356
Maximum of log data	0.530628	99% Chebyshev (MVUE) UCL	1.733883
Mean of log data	-0.640794	95% Non-parametric UCLs	
Standard Deviation of log data	0.536107	CLT UCL	0.876998
Variance of log data	0.287411	Adj-CLT UCL (Adjusted for skewness)	1.028424
RECOMMENDATION		Mod-t UCL (Adjusted for skewness)	0.940489
Data are lognormal (0.05)		Jackknife UCL	0.91687
Use H-UCL		Standard Bootstrap UCL	0.853268
0.999078		Bootstrap-t UCL	1.536195
		Hall's Bootstrap UCL	2.105318
		Percentile Bootstrap UCL	0.914375
		BCA Bootstrap UCL	1.085
		95% Chebyshev (Mean, Sd) UCL	1.310331
		97.5% Chebyshev (Mean, Sd) UCL	1.611472
		99% Chebyshev (Mean, Sd) UCL	2.203004

Raw Statistics		Normal Distribution Test	
Number of Valid Samples	8	Shapiro-Wilk Test Statistic	0.643871
Number of Unique Samples	8	Shapiro-Wilk 5% Critical Value	0.818
Minimum	0.73	Data not normal at 5% significance level	
Maximum	11	95% UCL (Assuming Normal Distribution)	
Mean	2.77875	Student's-t UCL	5.10221
Median	1.4	Gamma Distribution Test	
Standard Deviation	3.468707	A-D Test Statistic	0.720078
Variance	12.03193	A-D 5% Critical Value	0.731826
Coefficient of Variation	1.248298	K-S Test Statistic	0.257258
Skewness	2.414179	K-S 5% Critical Value	0.300132
Gamma Statistics		Data follow gamma distribution at 5% significance level	
k hat	1.25947	95% UCLs (Assuming Gamma Distribution)	
k star (bias corrected)	0.870502	Approximate Gamma UCL	5.935085
Theta hat	2.206285	Adjusted Gamma UCL	7.310635
Theta star	3.192123	Lognormal Distribution Test	
nu hat	20.15152	Shapiro-Wilk Test Statistic	0.880937
nu star	13.92804	Shapiro-Wilk 5% Critical Value	0.818
Approx. Chi Square Value (.05)	6.520974	Data are lognormal at 5% significance level	
Adjusted Level of Significance	0.01946	95% UCLs (Assuming Lognormal Distribution)	
Adjusted Chi Square Value	5.294004	95% H-UCL	8.319492
Log-transformed Statistics		95% Chebyshev (MVUE) UCL	6.13634
Minimum of log data	-0.314711	97.5% Chebyshev (MVUE) UCL	7.700337
Maximum of log data	2.397895	99% Chebyshev (MVUE) UCL	10.77251
Mean of log data	0.575136	95% Non-parametric UCLs	
Standard Deviation of log data	0.911334	CLT UCL	4.795954
Variance of log data	0.83053	Adj-CLT UCL (Adjusted for skewness)	5.914432
RECOMMENDATION		Mod-t UCL (Adjusted for skewness)	5.27667
Data follow gamma distribution (0.05)		Jackknife UCL	5.10221
Use Approximate Gamma UCL		Standard Bootstrap UCL	4.625138
		Bootstrap-t UCL	14.33418
		Hall's Bootstrap UCL	13.12687
		Percentile Bootstrap UCL	4.94625
		BCA Bootstrap UCL	4.78125
		95% Chebyshev (Mean, Sd) UCL	8.124386
		97.5% Chebyshev (Mean, Sd) UCL	10.43745
		99% Chebyshev (Mean, Sd) UCL	14.98101

5.935085

Raw Statistics		Normal Distribution Test	
Number of Valid Samples	8	Shapiro-Wilk Test Statistic	0.612758
Number of Unique Samples	8	Shapiro-Wilk 5% Critical Value	0.818
Minimum	3.3	Data not normal at 5% significance level	
Maximum	61	95% UCL (Assuming Normal Distribution)	
Mean	13.81875	Student's-t UCL	27.08795
Median	4.7	Gamma Distribution Test	
Standard Deviation	19.80966	A-D Test Statistic	0.917656
Variance	392.4228	A-D 5% Critical Value	0.736241
Coefficient of Variation	1.433535	K-S Test Statistic	0.322304
Skewness	2.45894	K-S 5% Critical Value	0.30166
Gamma Statistics		Data do not follow gamma distribution at 5% significance level	
k hat	0.980775	95% UCLs (Assuming Gamma Distribution)	
k star (bias corrected)	0.696318	Approximate Gamma UCL	32.99555
Theta hat	14.08962	Adjusted Gamma UCL	42.01165
Theta star	19.84546	Lognormal Distribution Test	
nu hat	15.69241	Shapiro-Wilk Test Statistic	0.821956
nu star	11.14109	Shapiro-Wilk 5% Critical Value	0.818
Approx. Chi Square Value (.05)	4.66596	Data are lognormal at 5% significance level	
Adjusted Level of Significance	0.01946	95% UCLs (Assuming Lognormal Distribution)	
Adjusted Chi Square Value	3.6646	95% H-UCL	53.6707
Log-transformed Statistics		95% Chebyshev (MVUE) UCL	31.56974
Minimum of log data	1.193922	97.5% Chebyshev (MVUE) UCL	40.03976
Maximum of log data	4.110874	99% Chebyshev (MVUE) UCL	56.67747
Mean of log data	2.036147	95% Non-parametric UCLs	
Standard Deviation of log data	1.036999	CLT UCL	25.33893
Variance of log data	1.075367	Adj-CLT UCL (Adjusted for skewness)	31.84495
RECOMMENDATION		Mod-t UCL (Adjusted for skewness)	28.10276
Data are lognormal (0.05)		Jackknife UCL	27.08795
Use 95% Chebyshev (MVUE) UCL		Standard Bootstrap UCL	24.56013
31.56974		Bootstrap-t UCL	88.59628
		Hall's Bootstrap UCL	88.8646
		Percentile Bootstrap UCL	25.53125
		BCA Bootstrap UCL	24.7125
		95% Chebyshev (Mean, Sd) UCL	44.34749
		97.5% Chebyshev (Mean, Sd) UCL	57.55731
		99% Chebyshev (Mean, Sd) UCL	83.50542

Raw Statistics		Normal Distribution Test	
Number of Valid Samples	8	Shapiro-Wilk Test Statistic	0.616288
Number of Unique Samples	8	Shapiro-Wilk 5% Critical Value	0.818
Minimum	0.43	Data not normal at 5% significance level	
Maximum	74	95% UCL (Assuming Normal Distribution)	
Mean	13.94125	Student's-t UCL	30.77653
Median	2.5	Gamma Distribution Test	
Standard Deviation	25.13349	A-D Test Statistic	0.539723
Variance	631.6922	A-D 5% Critical Value	0.772537
Coefficient of Variation	1.802815	K-S Test Statistic	0.21871
Skewness	2.475227	K-S 5% Critical Value	0.31131
Gamma Statistics		Data follow gamma distribution at 5% significance level	
k hat	0.441718	95% UCLs (Assuming Gamma Distribution)	
k star (bias corrected)	0.359407	Approximate Gamma UCL	52.97818
Theta hat	31.56144	Adjusted Gamma UCL	77.71591
Theta star	38.78959	Lognormal Distribution Test	
nu hat	7.067486	Shapiro-Wilk Test Statistic	0.904581
nu star	5.750512	Shapiro-Wilk 5% Critical Value	0.818
Approx. Chi Square Value (.05)	1.513252	Data are lognormal at 5% significance level	
Adjusted Level of Significance	0.01946	95% UCLs (Assuming Lognormal Distribution)	
Adjusted Chi Square Value	1.031569	95% H-UCL	1649.826
Log-transformed Statistics		95% Chebyshev (MVUE) UCL	50.47385
Minimum of log data	-0.84397	97.5% Chebyshev (MVUE) UCL	66.66813
Maximum of log data	4.304065	99% Chebyshev (MVUE) UCL	98.47866
Mean of log data	1.168599	95% Non-parametric UCLs	
Standard Deviation of log data	1.919441	CLT UCL	28.55747
Variance of log data	3.684255	Adj-CLT UCL (Adjusted for skewness)	36.86665
RECOMMENDATION		Mod-t UCL (Adjusted for skewness)	32.0726
Data follow gamma distribution (0.05)		Jackknife UCL	30.77653
Use Adjusted Gamma UCL		Standard Bootstrap UCL	27.52104
Recommen 77.71591		Bootstrap-t UCL	73.20898
		Hall's Bootstrap UCL	78.27732
		Percentile Bootstrap UCL	28.9325
		BCA Bootstrap UCL	28.18
		95% Chebyshev (Mean, Sd) UCL	52.67456
		97.5% Chebyshev (Mean, Sd) UCL	69.43449
		99% Chebyshev (Mean, Sd) UCL	102.3561

Raw Statistics		Normal Distribution Test	
Number of Valid Samples	8	Shapiro-Wilk Test Statistic	0.577544
Number of Unique Samples	8	Shapiro-Wilk 5% Critical Value	0.818
Minimum	0.66	Data not normal at 5% significance level	
Maximum	18	95% UCL (Assuming Normal Distribution)	
Mean	3.85125	Student's-t UCL	7.746762
Median	1.5	Gamma Distribution Test	
Standard Deviation	5.815633	A-D Test Statistic	0.838391
Variance	33.82158	A-D 5% Critical Value	0.736752
Coefficient of Variation	1.510064	K-S Test Statistic	0.261548
Skewness	2.646956	K-S 5% Critical Value	0.301798
Gamma Statistics		Data follow approximate gamma distribution at 5% significance level	
k hat	0.967499	95% UCLs (Assuming Gamma Distribution)	
k star (bias corrected)	0.68802	Approximate Gamma UCL	9.255846
Theta hat	3.980624	Adjusted Gamma UCL	11.80805
Theta star	5.597583	Lognormal Distribution Test	
nu hat	15.47998	Shapiro-Wilk Test Statistic	0.886745
nu star	11.00832	Shapiro-Wilk 5% Critical Value	0.818
Approx. Chi Square Value (.05)	4.580436	Data are lognormal at 5% significance level	
Adjusted Level of Significance	0.01946	95% UCLs (Assuming Lognormal Distribution)	
Adjusted Chi Square Value	3.590415	95% H-UCL	14.56191
Log-transformed Statistics		95% Chebyshev (MVUE) UCL	8.654495
Minimum of log data	-0.415515	97.5% Chebyshev (MVUE) UCL	10.97201
Maximum of log data	2.890372	99% Chebyshev (MVUE) UCL	15.52432
Mean of log data	0.749453	95% Non-parametric UCLs	
Standard Deviation of log data	1.031778	CLT UCL	7.233294
Variance of log data	1.064566	Adj-CLT UCL (Adjusted for skewness)	9.289346
RECOMMENDATION		Mod-t UCL (Adjusted for skewness)	8.067465
Assuming gamma distribution (0.05)		Jackknife UCL	7.746762
Use Approximate Gamma UCL		Standard Bootstrap UCL	6.965566
9.255846		Bootstrap-t UCL	22.77419
		Hall's Bootstrap UCL	19.92734
		Percentile Bootstrap UCL	7.71875
		BCA Bootstrap UCL	10.7125
		95% Chebyshev (Mean, Sd) UCL	12.81374
		97.5% Chebyshev (Mean, Sd) UCL	16.69182
		99% Chebyshev (Mean, Sd) UCL	24.30955

Raw Statistics		Normal Distribution Test	
Number of Valid Samples	8	Shapiro-Wilk Test Statistic	0.858922
Number of Unique Samples	8	Shapiro-Wilk 5% Critical Value	0.818
Minimum	0.15	Data are normal at 5% significance level	
Maximum	5	95% UCL (Assuming Normal Distribution)	
Mean	1.69125	Student's-t UCL	2.714676
Median	1.4	Gamma Distribution Test	
Standard Deviation	1.527878	A-D Test Statistic	0.155992
Variance	2.334413	A-D 5% Critical Value	0.730399
Coefficient of Variation	0.903402	K-S Test Statistic	0.120937
Skewness	1.61442	K-S 5% Critical Value	0.299616
Gamma Statistics		Data follow gamma distribution at 5% significance level	
k hat	1.360207	95% UCLs (Assuming Gamma Distribution)	
k star (bias corrected)	0.933463	Approximate Gamma UCL	3.500751
Theta hat	1.243376	Adjusted Gamma UCL	4.27254
Theta star	1.811802	Lognormal Distribution Test	
nu hat	21.76332	Shapiro-Wilk Test Statistic	0.96243
nu star	14.93541	Shapiro-Wilk 5% Critical Value	0.818
Approx. Chi Square Value (.05)	7.215454	Data are lognormal at 5% significance level	
Adjusted Level of Significance	0.01946	95% UCLs (Assuming Lognormal Distribution)	
Adjusted Chi Square Value	5.912059	95% H-UCL	9.071665
Log-transformed Statistics		95% Chebyshev (MVUE) UCL	4.902937
Minimum of log data	-1.89712	97.5% Chebyshev (MVUE) UCL	6.237701
Maximum of log data	1.609438	99% Chebyshev (MVUE) UCL	8.859587
Mean of log data	0.114842	95% Non-parametric UCLs	
Standard Deviation of log data	1.078285	CLT UCL	2.579778
Variance of log data	1.162698	Adj-CLT UCL (Adjusted for skewness)	2.909233
RECOMMENDATION		Mod-t UCL (Adjusted for skewness)	2.766064
Data are normal (0.05)		Jackknife UCL	2.714676
Use Student's-t UCL		Standard Bootstrap UCL	2.536564
2.714676		Bootstrap-t UCL	3.400869
		Hall's Bootstrap UCL	6.762071
		Percentile Bootstrap UCL	2.5525
		BCA Bootstrap UCL	3.1625
		95% Chebyshev (Mean, Sd) UCL	4.045869
		97.5% Chebyshev (Mean, Sd) UCL	5.064714
		99% Chebyshev (Mean, Sd) UCL	7.066039

Raw Statistics		Normal Distribution Test	
Number of Valid Samples	8	Shapiro-Wilk Test Statistic	0.537447
Number of Unique Samples	7	Shapiro-Wilk 5% Critical Value	0.818
Minimum	8.9	Data not normal at 5% significance level	
Maximum	620	95% UCL (Assuming Normal Distribution)	
Mean	104.7875	Student's-t UCL	246.3327
Median	15	Gamma Distribution Test	
Standard Deviation	211.3136	A-D Test Statistic	1.036544
Variance	44653.43	A-D 5% Critical Value	0.762686
Coefficient of Variation	2.016592	K-S Test Statistic	0.286287
Skewness	2.674394	K-S 5% Critical Value	0.309062
Gamma Statistics		Data follow approximate gamma distribution at 5% significance level	
k hat	0.498191	95% UCLs (Assuming Gamma Distribution)	
k star (bias corrected)	0.394703	Approximate Gamma UCL	367.1339
Theta hat	210.336	Adjusted Gamma UCL	525.3933
Theta star	265.4846	Lognormal Distribution Test	
nu hat	7.971058	Shapiro-Wilk Test Statistic	0.80884
nu star	6.315244	Shapiro-Wilk 5% Critical Value	0.818
Approx. Chi Square Value (.05)	1.8025	Data not lognormal at 5% significance level	
Adjusted Level of Significance	0.01946	95% UCLs (Assuming Lognormal Distribution)	
Adjusted Chi Square Value	1.259549	95% H-UCL	1702.662
Log-transformed Statistics		95% Chebyshev (MVUE) UCL	252.4162
Minimum of log data	2.186051	97.5% Chebyshev (MVUE) UCL	329.3038
Maximum of log data	6.429719	99% Chebyshev (MVUE) UCL	480.3348
Mean of log data	3.376242	95% Non-parametric UCLs	
Standard Deviation of log data	1.536904	CLT UCL	227.6756
Variance of log data	2.362075	Adj-CLT UCL (Adjusted for skewness)	303.1575
RECOMMENDATION		Mod-t UCL (Adjusted for skewness)	258.1063
Assuming gamma distribution (0.05)		Jackknife UCL	246.3327
Use Adjusted Gamma UCL		Standard Bootstrap UCL	221.4433
		Bootstrap-t UCL	1601.502
		Hall's Bootstrap UCL	1361.745
		Percentile Bootstrap UCL	244.3375
		BCA Bootstrap UCL	329.375
		95% Chebyshev (Mean, Sd) UCL	430.4436
		97.5% Chebyshev (Mean, Sd) UCL	571.3553
		99% Chebyshev (Mean, Sd) UCL	848.1489

525.3933

<b>Raw Statistics</b>		<b>Normal Distribution Test</b>	
Number of Valid Samples	8	Shapiro-Wilk Test Statistic	0.903153
Number of Unique Samples	8	Shapiro-Wilk 5% Critical Value	0.818
Minimum	0.046	Data are normal at 5% significance level	
Maximum	1.7	95% UCL (Assuming Normal Distribution)	
Mean	0.631375	Student's-t UCL	0.993419
Median	0.51	<b>Gamma Distribution Test</b>	
Standard Deviation	0.540498	A-D Test Statistic	0.161723
Variance	0.292138	A-D 5% Critical Value	0.730921
Coefficient of Variation	0.856065	K-S Test Statistic	0.136901
Skewness	1.196758	K-S 5% Critical Value	0.299804
<b>Gamma Statistics</b>		Data follow gamma distribution at 5% significance level	
k hat	1.323409	95% UCLs (Assuming Gamma Distribution)	
k star (bias corrected)	0.910464	Approximate Gamma UCL	1.321391
Theta hat	0.477082	Adjusted Gamma UCL	1.617936
Theta star	0.693465	<b>Lognormal Distribution Test</b>	
nu hat	21.17454	Shapiro-Wilk Test Statistic	0.940957
nu star	14.56742	Shapiro-Wilk 5% Critical Value	0.818
Approx. Chi Square Value (.05)	6.960474	Data are lognormal at 5% significance level	
Adjusted Level of Significance	0.01946	95% UCLs (Assuming Lognormal Distribution)	
Adjusted Chi Square Value	5.684715	95% H-UCL	4.0601
<b>Log-transformed Statistics</b>		95% Chebyshev (MVUE) UCL	1.951756
Minimum of log data	-3.079114	97.5% Chebyshev (MVUE) UCL	2.49245
Maximum of log data	0.530628	99% Chebyshev (MVUE) UCL	3.554538
Mean of log data	-0.883029	<b>95% Non-parametric UCLs</b>	
Standard Deviation of log data	1.131649	CLT UCL	0.945698
Variance of log data	1.280631	Adj-CLT UCL (Adjusted for skewness)	1.032094
<b>RECOMMENDATION</b>		Mod-t UCL (Adjusted for skewness)	1.006895
Data are normal (0.05)		Jackknife UCL	0.993419
Use Student's-t UCL		Standard Bootstrap UCL	0.929909
0.993419		Bootstrap-t UCL	1.275243
		Hall's Bootstrap UCL	2.890993
		Percentile Bootstrap UCL	0.95875
		BCA Bootstrap UCL	1.1325
		95% Chebyshev (Mean, Sd) UCL	1.464338
		97.5% Chebyshev (Mean, Sd) UCL	1.824762
		99% Chebyshev (Mean, Sd) UCL	2.532745

<b>Raw Statistics</b>		<b>Normal Distribution Test</b>	
Number of Valid Samples	8	Shapiro-Wilk Test Statistic	0.878304
Number of Unique Samples	8	Shapiro-Wilk 5% Critical Value	0.818
Minimum	0.35	Data are normal at 5% significance level	
Maximum	2.35	95% UCL (Assuming Normal Distribution)	
Mean	1.115	Student's-t UCL	1.637827
Median	0.84	<b>Gamma Distribution Test</b>	
Standard Deviation	0.780531	A-D Test Statistic	0.384466
Variance	0.609229	A-D 5% Critical Value	0.723353
Coefficient of Variation	0.700028	K-S Test Statistic	0.189918
Skewness	0.60242	K-S 5% Critical Value	0.297174
<b>Gamma Statistics</b>		Data follow gamma distribution at 5% significance level	
k hat	2.246787	95% UCLs (Assuming Gamma Distribution)	
k star (bias corrected)	1.487575	Approximate Gamma UCL	1.937689
Theta hat	0.496264	Adjusted Gamma UCL	2.24851
Theta star	0.749542	<b>Lognormal Distribution Test</b>	
nu hat	35.94858	Shapiro-Wilk Test Statistic	0.909108
nu star	23.8012	Shapiro-Wilk 5% Critical Value	0.818
Approx.Chi Square Value (.05)	13.69587	Data are lognormal at 5% significance level	
Adjusted Level of Significance	0.01946	95% UCLs (Assuming Lognormal Distribution)	
Adjusted Chi Square Value	11.80263	95% H-UCL	2.692584
<b>Log-transformed Statistics</b>		95% Chebyshev (MVUE) UCL	2.454724
Minimum of log data	-1.049822	97.5% Chebyshev (MVUE) UCL	3.031566
Maximum of log data	0.854415	99% Chebyshev (MVUE) UCL	4.164661
Mean of log data	-0.129893	<b>95% Non-parametric UCLs</b>	
Standard Deviation of log data	0.757846	CLT UCL	1.568913
Variance of log data	0.574331	Adj-CLT UCL (Adjusted for skewness)	1.631716
		Mod-t UCL (Adjusted for skewness)	1.647623
		Jackknife UCL	1.637827
		Standard Bootstrap UCL	1.532436
		Bootstrap-t UCL	1.747977
<b>RECOMMENDATION</b>		Hall's Bootstrap UCL	1.482512
Data are normal (0.05)		Percentile Bootstrap UCL	1.55625
		BCA Bootstrap UCL	1.7125
Use Student's-t UCL		95% Chebyshev (Mean, Sd) UCL	2.317879
		97.5% Chebyshev (Mean, Sd) UCL	2.838366
		99% Chebyshev (Mean, Sd) UCL	3.860761
1.637827			

## **A-1.4 Indoor Air - North Parcel**

<b>Raw Statistics</b>		<b>Normal Distribution Test</b>	
Number of Valid Samples	5	Shapiro-Wilk Test Statistic	0.868273
Number of Unique Samples	5	Shapiro-Wilk 5% Critical Value	0.762
Minimum	0.25	Data are normal at 5% significance level	
Maximum	5.1	95% UCL (Assuming Normal Distribution)	
Mean	3.31	Student's-t UCL	5.255244
Median	4.4	<b>Gamma Distribution Test</b>	
Standard Deviation	2.040343	A-D Test Statistic	0.654642
Variance	4.163	A-D 5% Critical Value	0.687096
Coefficient of Variation	0.616418	K-S Test Statistic	0.336552
Skewness	-1.022453	K-S 5% Critical Value	0.362061
<b>Gamma Statistics</b>		Data follow gamma distribution at 5% significance level	
k hat	1.428656	95% UCLs (Assuming Gamma Distribution)	
k star (bias corrected)	0.704796	Approximate Gamma UCL	10.62181
Theta hat	2.316864	Adjusted Gamma UCL	19.36221
Theta star	4.696397	<b>Lognormal Distribution Test</b>	
nu hat	14.28656	Shapiro-Wilk Test Statistic	0.737192
nu star	7.047956	Shapiro-Wilk 5% Critical Value	0.762
Approx.Chi Square Value (.05)	2.196304	Data not lognormal at 5% significance level	
Adjusted Level of Significance	0.0086	95% UCLs (Assuming Lognormal Distribution)	
Adjusted Chi Square Value	1.204859	95% H-UCL	241.4026
<b>Log-transformed Statistics</b>		95% Chebyshev (MVUE) UCL	13.34531
Minimum of log data	-1.386294	97.5% Chebyshev (MVUE) UCL	17.37192
Maximum of log data	1.629241	99% Chebyshev (MVUE) UCL	25.28142
Mean of log data	0.807813	<b>95% Non-parametric UCLs</b>	
Standard Deviation of log data	1.270737	CLT UCL	4.810878
Variance of log data	1.614773	Adj-CLT UCL (Adjusted for skewness)	4.365061
<b>RECOMMENDATION</b>		Mod-t UCL (Adjusted for skewness)	5.185705
Data are normal (0.05)		Jackknife UCL	5.255244
Use Student's-t UCL		Standard Bootstrap UCL	4.704565
Recommen 5.255244		Bootstrap-t UCL	4.782427
		Hall's Bootstrap UCL	4.203785
		Percentile Bootstrap UCL	4.66
		BCA Bootstrap UCL	4.8
		95% Chebyshev (Mean, Sd) UCL	7.287361
		97.5% Chebyshev (Mean, Sd) UCL	9.008368
		99% Chebyshev (Mean, Sd) UCL	12.38895

Raw Statistics		Normal Distribution Test	
Number of Valid Samples	5	Shapiro-Wilk Test Statistic	0.99175
Number of Unique Samples	5	Shapiro-Wilk 5% Critical Value	0.762
Minimum	0.06	Data are normal at 5% significance level	
Maximum	2.6	95% UCL (Assuming Normal Distribution)	
Mean	1.26	Student's-t UCL	2.167375
Median	1.3	Gamma Distribution Test	
Standard Deviation	0.951735	A-D Test Statistic	0.366089
Variance	0.9058	A-D 5% Critical Value	0.6903
Coefficient of Variation	0.755345	K-S Test Statistic	0.238049
Skewness	0.278813	K-S 5% Critical Value	0.363834
Gamma Statistics		Data follow gamma distribution at 5% significance level	
k hat	1.105035	95% UCLs (Assuming Gamma Distribution)	
k star (bias corrected)	0.575347	Approximate Gamma UCL	4.785913
Theta hat	1.140236	Adjusted Gamma UCL	9.590188
Theta star	2.189982	Lognormal Distribution Test	
nu hat	11.05035	Shapiro-Wilk Test Statistic	0.822679
nu star	5.753472	Shapiro-Wilk 5% Critical Value	0.762
Approx. Chi Square Value (.05)	1.514732	Data are lognormal at 5% significance level	
Adjusted Level of Significance	0.0086	95% UCLs (Assuming Lognormal Distribution)	
Adjusted Chi Square Value	0.755916	95% H-UCL	419.8855
Log-transformed Statistics		95% Chebyshev (MVUE) UCL	5.916271
Minimum of log data	-2.813411	97.5% Chebyshev (MVUE) UCL	7.767175
Maximum of log data	0.955511	99% Chebyshev (MVUE) UCL	11.40292
Mean of log data	-0.285327	95% Non-parametric UCLs	
Standard Deviation of log data	1.483377	CLT UCL	1.960097
Variance of log data	2.200407	Adj-CLT UCL (Adjusted for skewness)	2.016805
RECOMMENDATION		Mod-t UCL (Adjusted for skewness)	2.176221
Data are normal (0.05)		Jackknife UCL	2.167375
Use Student's-t UCL		Standard Bootstrap UCL	1.889694
2.167375		Bootstrap-t UCL	2.246521
		Hall's Bootstrap UCL	2.098295
		Percentile Bootstrap UCL	1.892
		BCA Bootstrap UCL	2.14
		95% Chebyshev (Mean, Sd) UCL	3.115274
		97.5% Chebyshev (Mean, Sd) UCL	3.918052
		99% Chebyshev (Mean, Sd) UCL	5.494955

<b>Raw Statistics</b>		<b>Normal Distribution Test</b>	
Number of Valid Samples	5	Shapiro-Wilk Test Statistic	0.815003
Number of Unique Samples	5	Shapiro-Wilk 5% Critical Value	0.762
Minimum	0.017	Data are normal at 5% significance level	
Maximum	0.15	95% UCL (Assuming Normal Distribution)	
Mean	0.0679	Student's-t UCL	0.127506
Median	0.034	<b>Gamma Distribution Test</b>	
Standard Deviation	0.06252	A-D Test Statistic	0.50727
Variance	0.003909	A-D 5% Critical Value	0.68754
Coefficient of Variation	0.920772	K-S Test Statistic	0.266707
Skewness	0.687837	K-S 5% Critical Value	0.362306
<b>Gamma Statistics</b>		Data follow gamma distribution at 5% significance level	
k hat	1.383857	95% UCLs (Assuming Gamma Distribution)	
k star (bias corrected)	0.686876	Approximate Gamma UCL	0.222277
Theta hat	0.049066	Adjusted Gamma UCL	0.409769
Theta star	0.098853	<b>Lognormal Distribution Test</b>	
nu hat	13.83857	Shapiro-Wilk Test Statistic	0.852381
nu star	6.86876	Shapiro-Wilk 5% Critical Value	0.762
Approx. Chi Square Value (.05)	2.098228	Data are lognormal at 5% significance level	
Adjusted Level of Significance	0.0086	95% UCLs (Assuming Lognormal Distribution)	
Adjusted Chi Square Value	1.138176	95% H-UCL	1.019411
<b>Log-transformed Statistics</b>		95% Chebyshev (MVUE) UCL	0.196732
Minimum of log data	-4.074542	97.5% Chebyshev (MVUE) UCL	0.252664
Maximum of log data	-1.89712	99% Chebyshev (MVUE) UCL	0.362533
Mean of log data	-3.092661	<b>95% Non-parametric UCLs</b>	
Standard Deviation of log data	1.028047	CLT UCL	0.11389
Variance of log data	1.056881	Adj-CLT UCL (Adjusted for skewness)	0.12308
<b>RECOMMENDATION</b>		Mod-t UCL (Adjusted for skewness)	0.12894
Data are normal (0.05)		Jackknife UCL	0.127506
Use Student's-t UCL		Standard Bootstrap UCL	0.108886
0.127506		Bootstrap-t UCL	0.370213
		Hall's Bootstrap UCL	0.836412
		Percentile Bootstrap UCL	0.1117
		BCA Bootstrap UCL	0.1036
		95% Chebyshev (Mean, Sd) UCL	0.189775
		97.5% Chebyshev (Mean, Sd) UCL	0.24251
		99% Chebyshev (Mean, Sd) UCL	0.346098

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Raw Statistics		Normal Distribution Test	
Number of Valid Samples	5	Shapiro-Wilk Test Statistic	0.689434
Number of Unique Samples	5	Shapiro-Wilk 5% Critical Value	0.762
Minimum	9.1	Data not normal at 5% significance level	
Maximum	1400	95% UCL (Assuming Normal Distribution)	
Mean	365.02	Student's-t UCL	923.9827
Median	180	Gamma Distribution Test	
Standard Deviation	586.2894	A-D Test Statistic	0.344328
Variance	343735.2	A-D 5% Critical Value	0.714037
Coefficient of Variation	1.606184	K-S Test Statistic	0.230604
Skewness	2.091655	K-S 5% Critical Value	0.372525
Gamma Statistics		Data follow gamma distribution at 5% significance level	
k hat	0.478175	95% UCLs (Assuming Gamma Distribution)	
k star (bias corrected)	0.324603	Approximate Gamma UCL	2640.75
Theta hat	763.3603	Adjusted Gamma UCL	6982.003
Theta star	1124.511	Lognormal Distribution Test	
nu hat	4.781753	Shapiro-Wilk Test Statistic	0.930058
nu star	3.246034	Shapiro-Wilk 5% Critical Value	0.762
Approx. Chi Square Value (.05)	0.448686	Data are lognormal at 5% significance level	
Adjusted Level of Significance	0.0086	95% UCLs (Assuming Lognormal Distribution)	
Adjusted Chi Square Value	0.169703	95% H-UCL	17375835
Log-transformed Statistics		95% Chebyshev (MVUE) UCL	1637.648
Minimum of log data	2.208274	97.5% Chebyshev (MVUE) UCL	2180.622
Maximum of log data	7.244228	99% Chebyshev (MVUE) UCL	3247.189
Mean of log data	4.562335	95% Non-parametric UCLs	
Standard Deviation of log data	2.063133	CLT UCL	796.295
Variance of log data	4.256518	Adj-CLT UCL (Adjusted for skewness)	1058.362
RECOMMENDATION		Mod-t UCL (Adjusted for skewness)	964.8599
Data follow gamma distribution (0.05)		Jackknife UCL	923.9827
Use Adjusted Gamma UCL		Standard Bootstrap UCL	749.9999
		Bootstrap-t UCL	2336.907
		Hall's Bootstrap UCL	3284.391
		Percentile Bootstrap UCL	846.4
		BCA Bootstrap UCL	928
		95% Chebyshev (Mean, Sd) UCL	1507.908
		97.5% Chebyshev (Mean, Sd) UCL	2002.437
		99% Chebyshev (Mean, Sd) UCL	2973.843

Recommen 6982.003



Raw Statistics		Normal Distribution Test	
Number of Valid Samples	5	Shapiro-Wilk Test Statistic	0.829281
Number of Unique Samples	4	Shapiro-Wilk 5% Critical Value	0.762
Minimum	0.1	Data are normal at 5% significance level	
Maximum	0.2	95% UCL (Assuming Normal Distribution)	
Mean	0.136	Student's-t UCL	0.172053
Median	0.13	Gamma Distribution Test	
Standard Deviation	0.037815	A-D Test Statistic	0.48505
Variance	0.00143	A-D 5% Critical Value	0.678721
Coefficient of Variation	0.278054	K-S Test Statistic	0.345334
Skewness	1.625492	K-S 5% Critical Value	0.35723
Gamma Statistics		Data follow gamma distribution at 5% significance level	
k hat	18.38321	95% UCLs (Assuming Gamma Distribution)	
k star (bias corrected)	7.486618	Approximate Gamma UCL	0.18203
Theta hat	0.007398	Adjusted Gamma UCL	0.208442
Theta star	0.018166	Lognormal Distribution Test	
nu hat	183.8321	Shapiro-Wilk Test Statistic	0.88863
nu star	74.86618	Shapiro-Wilk 5% Critical Value	0.762
Approx. Chi Square Value (.05)	55.93471	Data are lognormal at 5% significance level	
Adjusted Level of Significance	0.0086	95% UCLs (Assuming Lognormal Distribution)	
Adjusted Chi Square Value	48.84712	95% H-UCL	0.183265
Log-transformed Statistics		95% Chebyshev (MVUE) UCL	0.203013
Minimum of log data	-2.302585	97.5% Chebyshev (MVUE) UCL	0.232105
Maximum of log data	-1.609438	99% Chebyshev (MVUE) UCL	0.289252
Mean of log data	-2.022546	95% Non-parametric UCLs	
Standard Deviation of log data	0.254585	CLT UCL	0.163817
Variance of log data	0.064813	Adj-CLT UCL (Adjusted for skewness)	0.176953
RECOMMENDATION		Mod-t UCL (Adjusted for skewness)	0.174102
Data are normal (0.05)		Jackknife UCL	0.172053
Use Student's-t UCL		Standard Bootstrap UCL	N/R
0.172053		Bootstrap-t UCL	N/R
		Hall's Bootstrap UCL	N/R
		Percentile Bootstrap UCL	N/R
		BCA Bootstrap UCL	N/R
		95% Chebyshev (Mean, Sd) UCL	0.209716
		97.5% Chebyshev (Mean, Sd) UCL	0.241612
		99% Chebyshev (Mean, Sd) UCL	0.304268

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Raw Statistics		Normal Distribution Test	
Number of Valid Samples	5	Shapiro-Wilk Test Statistic	0.806804
Number of Unique Samples	5	Shapiro-Wilk 5% Critical Value	0.762
Minimum	0.041	Data are normal at 5% significance level	
Maximum	0.12	95% UCL (Assuming Normal Distribution)	
Mean	0.065	Student's-t UCL	0.095937
Median	0.056	Gamma Distribution Test	
Standard Deviation	0.03245	A-D Test Statistic	0.436577
Variance	0.001053	A-D 5% Critical Value	0.680293
Coefficient of Variation	0.49923	K-S Test Statistic	0.231417
Skewness	1.702965	K-S 5% Critical Value	0.358146
Gamma Statistics		Data follow gamma distribution at 5% significance level	
k hat	6.139899	95% UCLs (Assuming Gamma Distribution)	
k star (bias corrected)	2.589293	Approximate Gamma UCL	0.110038
Theta hat	0.010586	Adjusted Gamma UCL	0.141595
Theta star	0.025103	Lognormal Distribution Test	
nu hat	61.39899	Shapiro-Wilk Test Statistic	0.883289
nu star	25.89293	Shapiro-Wilk 5% Critical Value	0.762
Approx.Chi Square Value (.05)	15.29512	Data are lognormal at 5% significance level	
Adjusted Level of Significance	0.0086	95% UCLs (Assuming Lognormal Distribution)	
Adjusted Chi Square Value	11.88629	95% H-UCL	0.120302
Log-transformed Statistics		95% Chebyshev (MVUE) UCL	0.119135
Minimum of log data	-3.194183	97.5% Chebyshev (MVUE) UCL	0.142783
Maximum of log data	-2.120264	99% Chebyshev (MVUE) UCL	0.189233
Mean of log data	-2.817007	95% Non-parametric UCLs	
Standard Deviation of log data	0.437732	CLT UCL	0.08887
Variance of log data	0.191609	Adj-CLT UCL (Adjusted for skewness)	0.10068
RECOMMENDATION		Mod-t UCL (Adjusted for skewness)	0.09778
Data are normal (0.05)		Jackknife UCL	0.095937
Use Student's-t UCL		Standard Bootstrap UCL	0.08623
0.095937		Bootstrap-t UCL	0.13681
		Hall's Bootstrap UCL	0.188276
		Percentile Bootstrap UCL	0.0886
		BCA Bootstrap UCL	0.0828
		95% Chebyshev (Mean, Sd) UCL	0.128257
		97.5% Chebyshev (Mean, Sd) UCL	0.155628
		99% Chebyshev (Mean, Sd) UCL	0.209393

Raw Statistics		Normal Distribution Test	
Number of Valid Samples	5	Shapiro-Wilk Test Statistic	0.969515
Number of Unique Samples	5	Shapiro-Wilk 5% Critical Value	0.762
Minimum	0.25	Data are normal at 5% significance level	
Maximum	0.66	95% UCL (Assuming Normal Distribution)	
Mean	0.462	Student's-t UCL	0.611442
Median	0.51	Gamma Distribution Test	
Standard Deviation	0.156748	A-D Test Statistic	0.279991
Variance	0.02457	A-D 5% Critical Value	0.678993
Coefficient of Variation	0.339282	K-S Test Statistic	0.262507
Skewness	-0.242204	K-S 5% Critical Value	0.357634
Gamma Statistics		Data follow gamma distribution at 5% significance level	
k hat	9.691802	95% UCLs (Assuming Gamma Distribution)	
k star (bias corrected)	4.010054	Approximate Gamma UCL	0.696774
Theta hat	0.047669	Adjusted Gamma UCL	0.845875
Theta star	0.11521	Lognormal Distribution Test	
nu hat	96.91802	Shapiro-Wilk Test Statistic	0.938481
nu star	40.10054	Shapiro-Wilk 5% Critical Value	0.762
Approx. Chi Square Value (.05)	26.58891	Data are lognormal at 5% significance level	
Adjusted Level of Significance	0.0086	95% UCLs (Assuming Lognormal Distribution)	
Adjusted Chi Square Value	21.9021	95% H-UCL	0.764193
Log-transformed Statistics		95% Chebyshev (MVUE) UCL	0.801094
Minimum of log data	-1.386294	97.5% Chebyshev (MVUE) UCL	0.947146
Maximum of log data	-0.415515	99% Chebyshev (MVUE) UCL	1.234037
Mean of log data	-0.824667	95% Non-parametric UCLs	
Standard Deviation of log data	0.37538	CLT UCL	0.577304
Variance of log data	0.14091	Adj-CLT UCL (Adjusted for skewness)	0.569191
RECOMMENDATION		Mod-t UCL (Adjusted for skewness)	0.610177
Data are normal (0.05)		Jackknife UCL	0.611442
Use Student's-t UCL		Standard Bootstrap UCL	0.565191
0.611442		Bootstrap-t UCL	0.611792
		Hall's Bootstrap UCL	0.554593
		Percentile Bootstrap UCL	0.572
		BCA Bootstrap UCL	0.576
		95% Chebyshev (Mean, Sd) UCL	0.767559
		97.5% Chebyshev (Mean, Sd) UCL	0.899774
		99% Chebyshev (Mean, Sd) UCL	1.159485

<b>Raw Statistics</b>		<b>Normal Distribution Test</b>	
Number of Valid Samples	5	Shapiro-Wilk Test Statistic	0.777479
Number of Unique Samples	4	Shapiro-Wilk 5% Critical Value	0.762
Minimum	0.12	Data are normal at 5% significance level	
Maximum	0.19	95% UCL (Assuming Normal Distribution)	
Mean	0.168	Student's-t UCL	0.194456
Median	0.18	<b>Gamma Distribution Test</b>	
Standard Deviation	0.027749	A-D Test Statistic	0.742214
Variance	0.00077	A-D 5% Critical Value	0.678411
Coefficient of Variation	0.165172	K-S Test Statistic	0.350742
Skewness	-1.881438	K-S 5% Critical Value	0.356965
<b>Gamma Statistics</b>		Data follow approximate gamma distribution at 5% significance level	
k hat	39.47911	95% UCLs (Assuming Gamma Distribution)	
k star (bias corrected)	15.92498	Approximate Gamma UCL	0.204121
Theta hat	0.004255	Adjusted Gamma UCL	0.223213
Theta star	0.010549	<b>Lognormal Distribution Test</b>	
nu hat	394.7911	Shapiro-Wilk Test Statistic	0.74257
nu star	159.2498	Shapiro-Wilk 5% Critical Value	0.762
Approx. Chi Square Value (.05)	131.0694	Data not lognormal at 5% significance level	
Adjusted Level of Significance	0.0086	95% UCLs (Assuming Lognormal Distribution)	
Adjusted Chi Square Value	119.8586	95% H-UCL	0.206328
<b>Log-transformed Statistics</b>		95% Chebyshev (MVUE) UCL	0.228806
Minimum of log data	-2.120264	97.5% Chebyshev (MVUE) UCL	0.255046
Maximum of log data	-1.660731	99% Chebyshev (MVUE) UCL	0.30659
Mean of log data	-1.79651	<b>95% Non-parametric UCLs</b>	
Standard Deviation of log data	0.185208	CLT UCL	0.188412
Variance of log data	0.034302	Adj-CLT UCL (Adjusted for skewness)	0.177255
<b>RECOMMENDATION</b>		Mod-t UCL (Adjusted for skewness)	0.192715
Data are normal (0.05)		Jackknife UCL	0.194456
Use Student's-t UCL		Standard Bootstrap UCL	N/R
Recommen 0.194456		Bootstrap-t UCL	N/R
		Hall's Bootstrap UCL	N/R
		Percentile Bootstrap UCL	N/R
		BCA Bootstrap UCL	N/R
		95% Chebyshev (Mean, Sd) UCL	0.222093
		97.5% Chebyshev (Mean, Sd) UCL	0.245498
		99% Chebyshev (Mean, Sd) UCL	0.291475

Raw Statistics		Normal Distribution Test	
Number of Valid Samples	5	Shapiro-Wilk Test Statistic	0.904907
Number of Unique Samples	5	Shapiro-Wilk 5% Critical Value	0.762
Minimum	0.185	Data are normal at 5% significance level	
Maximum	1.4	95% UCL (Assuming Normal Distribution)	
Mean	0.873	Student's-t UCL	1.364708
Median	1.1	Gamma Distribution Test	
Standard Deviation	0.515747	A-D Test Statistic	0.449537
Variance	0.265995	A-D 5% Critical Value	0.683778
Coefficient of Variation	0.590776	K-S Test Statistic	0.320448
Skewness	-0.587198	K-S 5% Critical Value	0.360082
Gamma Statistics		Data follow gamma distribution at 5% significance level	
k hat	2.369293	95% UCLs (Assuming Gamma Distribution)	
k star (bias corrected)	1.08105	Approximate Gamma UCL	2.119111
Theta hat	0.368464	Adjusted Gamma UCL	3.30358
Theta star	0.807548	Lognormal Distribution Test	
nu hat	23.69293	Shapiro-Wilk Test Statistic	0.849238
nu star	10.8105	Shapiro-Wilk 5% Critical Value	0.762
Approx. Chi Square Value (.05)	4.453552	Data are lognormal at 5% significance level	
Adjusted Level of Significance	0.0086	95% UCLs (Assuming Lognormal Distribution)	
Adjusted Chi Square Value	2.85677	95% H-UCL	6.125907
Log-transformed Statistics		95% Chebyshev (MVUE) UCL	2.395421
Minimum of log data	-1.687399	97.5% Chebyshev (MVUE) UCL	3.034609
Maximum of log data	0.336472	99% Chebyshev (MVUE) UCL	4.29017
Mean of log data	-0.361453	95% Non-parametric UCLs	
Standard Deviation of log data	0.849754	CLT UCL	1.252384
Variance of log data	0.722081	Adj-CLT UCL (Adjusted for skewness)	1.187665
RECOMMENDATION		Mod-t UCL (Adjusted for skewness)	1.354613
Data are normal (0.05)		Jackknife UCL	1.364708
Use Student's-t UCL		Standard Bootstrap UCL	1.213167
1.364708		Bootstrap-t UCL	1.329038
		Hall's Bootstrap UCL	1.095092
		Percentile Bootstrap UCL	1.22
		BCA Bootstrap UCL	1.116
		95% Chebyshev (Mean, Sd) UCL	1.878376
		97.5% Chebyshev (Mean, Sd) UCL	2.313403
		99% Chebyshev (Mean, Sd) UCL	3.167929

Raw Statistics		Normal Distribution Test	
Number of Valid Samples	5	Shapiro-Wilk Test Statistic	0.760595
Number of Unique Samples	5	Shapiro-Wilk 5% Critical Value	0.762
Minimum	0.12	Data not normal at 5% significance level	
Maximum	3.3	95% UCL (Assuming Normal Distribution)	
Mean	1.124	Student's-t UCL	2.314796
Median	0.69	Gamma Distribution Test	
Standard Deviation	1.249012	A-D Test Statistic	0.36432
Variance	1.56003	A-D 5% Critical Value	0.68988
Coefficient of Variation	1.11122	K-S Test Statistic	0.26842
Skewness	1.939247	K-S 5% Critical Value	0.363602
Gamma Statistics		Data follow gamma distribution at 5% significance level	
k hat	1.147485	95% UCLs (Assuming Gamma Distribution)	
k star (bias corrected)	0.592327	Approximate Gamma UCL	4.160339
Theta hat	0.979534	Adjusted Gamma UCL	8.217552
Theta star	1.8976	Lognormal Distribution Test	
nu hat	11.47485	Shapiro-Wilk Test Statistic	0.938856
nu star	5.923273	Shapiro-Wilk 5% Critical Value	0.762
Approx. Chi Square Value (.05)	1.600293	Data are lognormal at 5% significance level	
Adjusted Level of Significance	0.0086	95% UCLs (Assuming Lognormal Distribution)	
Adjusted Chi Square Value	0.810188	95% H-UCL	39.86998
Log-transformed Statistics		95% Chebyshev (MVUE) UCL	3.62704
Minimum of log data	-2.120264	97.5% Chebyshev (MVUE) UCL	4.700706
Maximum of log data	1.193922	99% Chebyshev (MVUE) UCL	6.809715
Mean of log data	-0.378395	95% Non-parametric UCLs	
Standard Deviation of log data	1.181613	CLT UCL	2.042774
Variance of log data	1.39621	Adj-CLT UCL (Adjusted for skewness)	2.560393
RECOMMENDATION		Mod-t UCL (Adjusted for skewness)	2.395534
Data follow gamma distribution (0.05)		Jackknife UCL	2.314796
Use Approximate Gamma UCL		Standard Bootstrap UCL	1.954589
		Bootstrap-t UCL	4.782986
		Hall's Bootstrap UCL	7.012184
		Percentile Bootstrap UCL	2.128
		BCA Bootstrap UCL	2.296
		95% Chebyshev (Mean, Sd) UCL	3.558772
		97.5% Chebyshev (Mean, Sd) UCL	4.6123
		99% Chebyshev (Mean, Sd) UCL	6.681751

Recommen 4.160339

Raw Statistics		Normal Distribution Test	
Number of Valid Samples	5	Shapiro-Wilk Test Statistic	0.691598
Number of Unique Samples	5	Shapiro-Wilk 5% Critical Value	0.762
Minimum	0.12	Data not normal at 5% significance level	
Maximum	2.5	95% UCL (Assuming Normal Distribution)	
Mean	0.802	Student's-t UCL	1.718357
Median	0.48	Gamma Distribution Test	
Standard Deviation	0.961156	A-D Test Statistic	0.55434
Variance	0.92382	A-D 5% Critical Value	0.689622
Coefficient of Variation	1.198448	K-S Test Statistic	0.368318
Skewness	2.092386	K-S 5% Critical Value	0.363459
Gamma Statistics		Data follow approximate gamma distribution at 5% significance level	
k hat	1.173574	95% UCLs (Assuming Gamma Distribution)	
k star (bias corrected)	0.602763	Approximate Gamma UCL	2.923589
Theta hat	0.683383	Adjusted Gamma UCL	5.725762
Theta star	1.33054	Lognormal Distribution Test	
nu hat	11.73574	Shapiro-Wilk Test Statistic	0.906706
nu star	6.027628	Shapiro-Wilk 5% Critical Value	0.762
Approx. Chi Square Value (.05)	1.653501	Data are lognormal at 5% significance level	
Adjusted Level of Significance	0.0086	95% UCLs (Assuming Lognormal Distribution)	
Adjusted Chi Square Value	0.844282	95% H-UCL	15.03551
Log-transformed Statistics		95% Chebyshev (MVUE) UCL	2.292334
Minimum of log data	-2.120264	97.5% Chebyshev (MVUE) UCL	2.953683
Maximum of log data	0.916291	99% Chebyshev (MVUE) UCL	4.252775
Mean of log data	-0.703758	95% Non-parametric UCLs	
Standard Deviation of log data	1.07922	CLT UCL	1.509027
Variance of log data	1.164716	Adj-CLT UCL (Adjusted for skewness)	1.938807
RECOMMENDATION		Mod-t UCL (Adjusted for skewness)	1.785394
Assuming gamma distribution (0.05)		Jackknife UCL	1.718357
Use Approximate Gamma UCL		Standard Bootstrap UCL	1.431995
Recommen 2.923589		Bootstrap-t UCL	10.36598
		Hall's Bootstrap UCL	7.896395
		Percentile Bootstrap UCL	1.62
		BCA Bootstrap UCL	1.682
		95% Chebyshev (Mean, Sd) UCL	2.675637
		97.5% Chebyshev (Mean, Sd) UCL	3.486361
		99% Chebyshev (Mean, Sd) UCL	5.078872

<b>Raw Statistics</b>		<b>Normal Distribution Test</b>	
Number of Valid Samples	5	Shapiro-Wilk Test Statistic	0.966192
Number of Unique Samples	5	Shapiro-Wilk 5% Critical Value	0.762
Minimum	0.28	Data are normal at 5% significance level	
Maximum	2.1	95% UCL (Assuming Normal Distribution)	
Mean	1.29	Student's-t UCL	1.950322
Median	1.5	<b>Gamma Distribution Test</b>	
Standard Deviation	0.692604	A-D Test Statistic	0.408203
Variance	0.4797	A-D 5% Critical Value	0.683064
Coefficient of Variation	0.536902	K-S Test Statistic	0.276034
Skewness	-0.617742	K-S 5% Critical Value	0.35967
<b>Gamma Statistics</b>		Data follow gamma distribution at 5% significance level	
k hat	2.761601	95% UCLs (Assuming Gamma Distribution)	
k star (bias corrected)	1.237974	Approximate Gamma UCL	2.915724
Theta hat	0.46712	Adjusted Gamma UCL	4.371144
Theta star	1.042025	<b>Lognormal Distribution Test</b>	
nu hat	27.61601	Shapiro-Wilk Test Statistic	0.839909
nu star	12.37974	Shapiro-Wilk 5% Critical Value	0.762
Approx.Chi Square Value (.05)	5.47715	Data are lognormal at 5% significance level	
Adjusted Level of Significance	0.0086	95% UCLs (Assuming Lognormal Distribution)	
Adjusted Chi Square Value	3.653474	95% H-UCL	7.328686
<b>Log-transformed Statistics</b>		95% Chebyshev (MVUE) UCL	3.415962
Minimum of log data	-1.272966	97.5% Chebyshev (MVUE) UCL	4.306079
Maximum of log data	0.741937	99% Chebyshev (MVUE) UCL	6.054543
Mean of log data	0.062796	<b>95% Non-parametric UCLs</b>	
Standard Deviation of log data	0.796465	CLT UCL	1.79948
Variance of log data	0.634357	Adj-CLT UCL (Adjusted for skewness)	1.708047
<b>RECOMMENDATION</b>		Mod-t UCL (Adjusted for skewness)	1.93606
Data are normal (0.05)		Jackknife UCL	1.950322
Use Student's-t UCL		Standard Bootstrap UCL	1.751796
1.950322		Bootstrap-t UCL	1.782408
		Hall's Bootstrap UCL	1.679186
		Percentile Bootstrap UCL	1.754
		BCA Bootstrap UCL	1.8
		95% Chebyshev (Mean, Sd) UCL	2.640133
		97.5% Chebyshev (Mean, Sd) UCL	3.224337
		99% Chebyshev (Mean, Sd) UCL	4.371892

**A-1.5 Indoor Air - West Parcel**

## **Too Few Samples for UCL calculations**

## **A-1.6 Indoor Air - South Parcel - Bishop**

## **Too Few Samples for UCL calculations**

**A-1.7 Indoor Air - South Parcel - LA Carts/Oncology Care**

<b>Raw Statistics</b>		<b>Normal Distribution Test</b>	
Number of Valid Samples	5	Shapiro-Wilk Test Statistic	0.815801
Number of Unique Samples	5	Shapiro-Wilk 5% Critical Value	0.762
Minimum	0.092	Data are normal at 5% significance level	
Maximum	1.9	95% UCL (Assuming Normal Distribution)	
Mean	0.6924	Student's-t UCL	1.446283
Median	0.21	<b>Gamma Distribution Test</b>	
Standard Deviation	0.790739	A-D Test Statistic	0.447126
Variance	0.625269	A-D 5% Critical Value	0.693802
Coefficient of Variation	1.142027	K-S Test Statistic	0.317805
Skewness	1.136976	K-S 5% Critical Value	0.365215
<b>Gamma Statistics</b>		Data follow gamma distribution at 5% significance level	
k hat	0.910928	95% UCLs (Assuming Gamma Distribution)	
k star (bias corrected)	0.497705	Approximate Gamma UCL	3.019732
Theta hat	0.760104	Adjusted Gamma UCL	6.523304
Theta star	1.391187	<b>Lognormal Distribution Test</b>	
nu hat	9.109282	Shapiro-Wilk Test Statistic	0.899538
nu star	4.977046	Shapiro-Wilk 5% Critical Value	0.762
Approx.Chi Square Value (.05)	1.141196	Data are lognormal at 5% significance level	
Adjusted Level of Significance	0.0086	95% UCLs (Assuming Lognormal Distribution)	
Adjusted Chi Square Value	0.528276	95% H-UCL	50.70774
<b>Log-transformed Statistics</b>		95% Chebyshev (MVUE) UCL	2.273397
Minimum of log data	-2.385967	97.5% Chebyshev (MVUE) UCL	2.964058
Maximum of log data	0.641854	99% Chebyshev (MVUE) UCL	4.320728
Mean of log data	-1.008406	<b>95% Non-parametric UCLs</b>	
Standard Deviation of log data	1.306087	CLT UCL	1.274069
Variance of log data	1.705864	Adj-CLT UCL (Adjusted for skewness)	1.466199
<b>RECOMMENDATION</b>		Mod-t UCL (Adjusted for skewness)	1.476252
Data are normal (0.05)		Jackknife UCL	1.446283
Use Student's-t UCL		Standard Bootstrap UCL	1.211344
1.446283		Bootstrap-t UCL	8.552351
		Hall's Bootstrap UCL	10.01428
		Percentile Bootstrap UCL	1.232
		BCA Bootstrap UCL	1.392
		95% Chebyshev (Mean, Sd) UCL	2.233835
		97.5% Chebyshev (Mean, Sd) UCL	2.900815
		99% Chebyshev (Mean, Sd) UCL	4.210968

Raw Statistics		Normal Distribution Test	
Number of Valid Samples	5	Shapiro-Wilk Test Statistic	0.798694
Number of Unique Samples	5	Shapiro-Wilk 5% Critical Value	0.762
Minimum	0.015	Data are normal at 5% significance level	
Maximum	0.92	95% UCL (Assuming Normal Distribution)	
Mean	0.3326	Student's-t UCL	0.726783
Median	0.058	Gamma Distribution Test	
Standard Deviation	0.413454	A-D Test Statistic	0.475315
Variance	0.170944	A-D 5% Critical Value	0.705621
Coefficient of Variation	1.243095	K-S Test Statistic	0.324176
Skewness	0.890803	K-S 5% Critical Value	0.369541
Gamma Statistics		Data follow gamma distribution at 5% significance level	
k hat	0.605008	95% UCLs (Assuming Gamma Distribution)	
k star (bias corrected)	0.375337	Approximate Gamma UCL	1.992655
Theta hat	0.549744	Adjusted Gamma UCL	4.990376
Theta star	0.886138	Lognormal Distribution Test	
nu hat	6.050084	Shapiro-Wilk Test Statistic	0.896691
nu star	3.753367	Shapiro-Wilk 5% Critical Value	0.762
Approx. Chi Square Value (.05)	0.626486	Data are lognormal at 5% significance level	
Adjusted Level of Significance	0.0086	95% UCLs (Assuming Lognormal Distribution)	
Adjusted Chi Square Value	0.250155	95% H-UCL	880.2982
Log-transformed Statistics		95% Chebyshev (MVUE) UCL	1.372888
Minimum of log data	-4.199705	97.5% Chebyshev (MVUE) UCL	1.817139
Maximum of log data	-0.083382	99% Chebyshev (MVUE) UCL	2.689785
Mean of log data	-2.120833	95% Non-parametric UCLs	
Standard Deviation of log data	1.765285	CLT UCL	0.636737
Variance of log data	3.11623	Adj-CLT UCL (Adjusted for skewness)	0.715445
RECOMMENDATION		Mod-t UCL (Adjusted for skewness)	0.739059
Data are normal (0.05)		Jackknife UCL	0.726783
Use Student's-t UCL		Standard Bootstrap UCL	0.598442
0.726783		Bootstrap-t UCL	6.171837
		Hall's Bootstrap UCL	7.277575
		Percentile Bootstrap UCL	0.619
		BCA Bootstrap UCL	0.6876
		95% Chebyshev (Mean, Sd) UCL	1.138569
		97.5% Chebyshev (Mean, Sd) UCL	1.487313
		99% Chebyshev (Mean, Sd) UCL	2.172352

Raw Statistics		Normal Distribution Test	
Number of Valid Samples	5	Shapiro-Wilk Test Statistic	0.855073
Number of Unique Samples	4	Shapiro-Wilk 5% Critical Value	0.762
Minimum	0.0135	Data are normal at 5% significance level	
Maximum	0.08	95% UCL (Assuming Normal Distribution)	
Mean	0.0482	Student's-t UCL	0.077017
Median	0.036	Gamma Distribution Test	
Standard Deviation	0.030225	A-D Test Statistic	0.386933
Variance	0.000914	A-D 5% Critical Value	0.683148
Coefficient of Variation	0.627083	K-S Test Statistic	0.265747
Skewness	0.24233	K-S 5% Critical Value	0.359719
Gamma Statistics		Data follow gamma distribution at 5% significance level	
k hat	2.715178	95% UCLs (Assuming Gamma Distribution)	
k star (bias corrected)	1.219405	Approximate Gamma UCL	0.109776
Theta hat	0.017752	Adjusted Gamma UCL	0.165257
Theta star	0.039527	Lognormal Distribution Test	
nu hat	27.15178	Shapiro-Wilk Test Statistic	0.896951
nu star	12.19405	Shapiro-Wilk 5% Critical Value	0.762
Approx. Chi Square Value (.05)	5.354092	Data are lognormal at 5% significance level	
Adjusted Level of Significance	0.0086	95% UCLs (Assuming Lognormal Distribution)	
Adjusted Chi Square Value	3.556605	95% H-UCL	0.216908
Log-transformed Statistics		95% Chebyshev (MVUE) UCL	0.118635
Minimum of log data	-4.305066	97.5% Chebyshev (MVUE) UCL	0.148734
Maximum of log data	-2.525729	99% Chebyshev (MVUE) UCL	0.207858
Mean of log data	-3.227705	95% Non-parametric UCLs	
Standard Deviation of log data	0.74305	CLT UCL	0.070434
Variance of log data	0.552124	Adj-CLT UCL (Adjusted for skewness)	0.071999
RECOMMENDATION		Mod-t UCL (Adjusted for skewness)	0.077261
Data are normal (0.05)		Jackknife UCL	0.077017
Use Student's-t UCL		Standard Bootstrap UCL	N/R
0.077017		Bootstrap-t UCL	N/R
		Hall's Bootstrap UCL	N/R
		Percentile Bootstrap UCL	N/R
		BCA Bootstrap UCL	N/R
		95% Chebyshev (Mean, Sd) UCL	0.10712
		97.5% Chebyshev (Mean, Sd) UCL	0.132615
		99% Chebyshev (Mean, Sd) UCL	0.182695

Raw Statistics		Normal Distribution Test	
Number of Valid Samples	5	Shapiro-Wilk Test Statistic	0.854032
Number of Unique Samples	5	Shapiro-Wilk 5% Critical Value	0.762
Minimum	0.028	Data are normal at 5% significance level	
Maximum	0.08	95% UCL (Assuming Normal Distribution)	
Mean	0.0481	Student's-t UCL	0.070096
Median	0.036	Gamma Distribution Test	
Standard Deviation	0.023072	A-D Test Statistic	0.457403
Variance	0.000532	A-D 5% Critical Value	0.680421
Coefficient of Variation	0.47966	K-S Test Statistic	0.299474
Skewness	0.774301	K-S 5% Critical Value	0.358196
Gamma Statistics		Data follow gamma distribution at 5% significance level	
k hat	5.788545	95% UCLs (Assuming Gamma Distribution)	
k star (bias corrected)	2.448751	Approximate Gamma UCL	0.082841
Theta hat	0.00831	Adjusted Gamma UCL	0.107542
Theta star	0.019643	Lognormal Distribution Test	
nu hat	57.88545	Shapiro-Wilk Test Statistic	0.879156
nu star	24.48751	Shapiro-Wilk 5% Critical Value	0.762
Approx. Chi Square Value (.05)	14.21826	Data are lognormal at 5% significance level	
Adjusted Level of Significance	0.0086	95% UCLs (Assuming Lognormal Distribution)	
Adjusted Chi Square Value	10.95249	95% H-UCL	0.094925
Log-transformed Statistics		95% Chebyshev (MVUE) UCL	0.09107
Minimum of log data	-3.575551	97.5% Chebyshev (MVUE) UCL	0.109736
Maximum of log data	-2.525729	99% Chebyshev (MVUE) UCL	0.1464
Mean of log data	-3.12333	95% Non-parametric UCLs	
Standard Deviation of log data	0.465272	CLT UCL	0.065072
Variance of log data	0.216478	Adj-CLT UCL (Adjusted for skewness)	0.068889
RECOMMENDATION		Mod-t UCL (Adjusted for skewness)	0.070692
Data are normal (0.05)		Jackknife UCL	0.070096
Use Student's-t UCL		Standard Bootstrap UCL	0.063388
0.070096		Bootstrap-t UCL	0.15276
		Hall's Bootstrap UCL	0.243195
		Percentile Bootstrap UCL	0.0636
		BCA Bootstrap UCL	0.0682
		95% Chebyshev (Mean, Sd) UCL	0.093075
		97.5% Chebyshev (Mean, Sd) UCL	0.112536
		99% Chebyshev (Mean, Sd) UCL	0.150762

Raw Statistics		Normal Distribution Test	
Number of Valid Samples	5	Shapiro-Wilk Test Statistic	0.759677
Number of Unique Samples	5	Shapiro-Wilk 5% Critical Value	0.762
Minimum	31	Data not normal at 5% significance level	
Maximum	490	95% UCL (Assuming Normal Distribution)	
Mean	160.6	Student's-t UCL	348.5553
Median	42	Gamma Distribution Test	
Standard Deviation	197.1441	A-D Test Statistic	0.568208
Variance	38865.8	A-D 5% Critical Value	0.692604
Coefficient of Variation	1.227547	K-S Test Statistic	0.359525
Skewness	1.642456	K-S 5% Critical Value	0.364824
Gamma Statistics		Data follow gamma distribution at 5% significance level	
k hat	0.954252	95% UCLs (Assuming Gamma Distribution)	
k star (bias corrected)	0.515034	Approximate Gamma UCL	676.9551
Theta hat	168.2994	Adjusted Gamma UCL	1436.025
Theta star	311.8241	Lognormal Distribution Test	
nu hat	9.542517	Shapiro-Wilk Test Statistic	0.840455
nu star	5.15034	Shapiro-Wilk 5% Critical Value	0.762
Approx. Chi Square Value (.05)	1.22186	Data are lognormal at 5% significance level	
Adjusted Level of Significance	0.0086	95% UCLs (Assuming Lognormal Distribution)	
Adjusted Chi Square Value	0.575996	95% H-UCL	6259.005
Log-transformed Statistics		95% Chebyshev (MVUE) UCL	481.8599
Minimum of log data	3.433987	97.5% Chebyshev (MVUE) UCL	625.4871
Maximum of log data	6.194405	99% Chebyshev (MVUE) UCL	907.6148
Mean of log data	4.470652	95% Non-parametric UCLs	
Standard Deviation of log data	1.21238	CLT UCL	305.6194
Variance of log data	1.469865	Adj-CLT UCL (Adjusted for skewness)	374.8165
RECOMMENDATION		Mod-t UCL (Adjusted for skewness)	359.3487
Data follow gamma distribution (0.05)		Jackknife UCL	348.5553
Use Approximate Gamma UCL		Standard Bootstrap UCL	292.1601
		Bootstrap-t UCL	4716.388
		Hall's Bootstrap UCL	3015.929
		Percentile Bootstrap UCL	308.6
		BCA Bootstrap UCL	342.4
		95% Chebyshev (Mean, Sd) UCL	544.9046
		97.5% Chebyshev (Mean, Sd) UCL	711.1935
		99% Chebyshev (Mean, Sd) UCL	1037.836

Recommen 676.9551

<b>Raw Statistics</b>		<b>Normal Distribution Test</b>	
Number of Valid Samples	5	Shapiro-Wilk Test Statistic	0.875586
Number of Unique Samples	5	Shapiro-Wilk 5% Critical Value	0.762
Minimum	0.36	Data are normal at 5% significance level	
Maximum	0.68	95% UCL (Assuming Normal Distribution)	
Mean	0.472	Student's-t UCL	0.595094
Median	0.42	<b>Gamma Distribution Test</b>	
Standard Deviation	0.129112	A-D Test Statistic	0.356191
Variance	0.01667	A-D 5% Critical Value	0.678717
Coefficient of Variation	0.273543	K-S Test Statistic	0.26097
Skewness	1.34679	K-S 5% Critical Value	0.357222
<b>Gamma Statistics</b>		Data follow gamma distribution at 5% significance level	
k hat	18.56292	95% UCLs (Assuming Gamma Distribution)	
k star (bias corrected)	7.558502	Approximate Gamma UCL	0.630801
Theta hat	0.025427	Adjusted Gamma UCL	0.721805
Theta star	0.062446	<b>Lognormal Distribution Test</b>	
nu hat	185.6292	Shapiro-Wilk Test Statistic	0.917163
nu star	75.58502	Shapiro-Wilk 5% Critical Value	0.762
Approx. Chi Square Value (.05)	56.55684	Data are lognormal at 5% significance level	
Adjusted Level of Significance	0.0086	95% UCLs (Assuming Lognormal Distribution)	
Adjusted Chi Square Value	49.42626	95% H-UCL	0.636089
<b>Log-transformed Statistics</b>		95% Chebyshev (MVUE) UCL	0.704645
Minimum of log data	-1.021651	97.5% Chebyshev (MVUE) UCL	0.805594
Maximum of log data	-0.385662	99% Chebyshev (MVUE) UCL	1.003888
Mean of log data	-0.777953	<b>95% Non-parametric UCLs</b>	
Standard Deviation of log data	0.254473	CLT UCL	0.566975
Variance of log data	0.064756	Adj-CLT UCL (Adjusted for skewness)	0.604135
<b>RECOMMENDATION</b>		Mod-t UCL (Adjusted for skewness)	0.600891
Data are normal (0.05)		Jackknife UCL	0.595094
Use Student's-t UCL		Standard Bootstrap UCL	0.555237
0.595094		Bootstrap-t UCL	0.862941
		Hall's Bootstrap UCL	1.162127
		Percentile Bootstrap UCL	0.564
		BCA Bootstrap UCL	0.612
		95% Chebyshev (Mean, Sd) UCL	0.723686
		97.5% Chebyshev (Mean, Sd) UCL	0.832591
		99% Chebyshev (Mean, Sd) UCL	1.046514

Raw Statistics		Normal Distribution Test	
Number of Valid Samples	5	Shapiro-Wilk Test Statistic	0.913508
Number of Unique Samples	4	Shapiro-Wilk 5% Critical Value	0.762
Minimum	0.079	Data are normal at 5% significance level	
Maximum	0.083	95% UCL (Assuming Normal Distribution)	
Mean	0.0808	Student's-t UCL	0.082367
Median	0.08	Gamma Distribution Test	
Standard Deviation	0.001643	A-D Test Statistic	0.399327
Variance	2.70E-06	A-D 5% Critical Value	0.67808
Coefficient of Variation	0.020336	K-S Test Statistic	0.314759
Skewness	0.518421	K-S 5% Critical Value	0.35682
Gamma Statistics		Data follow gamma distribution at 5% significance level	
k hat	3034.697	95% UCLs (Assuming Gamma Distribution)	
k star (bias corrected)	1214.012	Approximate Gamma UCL	0.082535
Theta hat	2.66E-05	Adjusted Gamma UCL	0.083327
Theta star	6.66E-05	Lognormal Distribution Test	
nu hat	30346.97	Shapiro-Wilk Test Statistic	0.914757
nu star	12140.12	Shapiro-Wilk 5% Critical Value	0.762
Approx. Chi Square Value (.05)	11884.9	Data are lognormal at 5% significance level	
Adjusted Level of Significance	0.0086	95% UCLs (Assuming Lognormal Distribution)	
Adjusted Chi Square Value	11771.95	95% H-UCL	N/A
Log-transformed Statistics		95% Chebyshev (MVUE) UCL	0.083994
Minimum of log data	-2.538307	97.5% Chebyshev (MVUE) UCL	0.085375
Maximum of log data	-2.488915	99% Chebyshev (MVUE) UCL	0.08809
Mean of log data	-2.515943	95% Non-parametric UCLs	
Standard Deviation of log data	0.020276	CLT UCL	0.082009
Variance of log data	0.000411	Adj-CLT UCL (Adjusted for skewness)	0.082191
RECOMMENDATION		Mod-t UCL (Adjusted for skewness)	0.082395
Data are normal (0.05)		Jackknife UCL	0.082367
Use Student's-t UCL		Standard Bootstrap UCL	N/R
0.082367		Bootstrap-t UCL	N/R
		Hall's Bootstrap UCL	N/R
		Percentile Bootstrap UCL	N/R
		BCA Bootstrap UCL	N/R
		95% Chebyshev (Mean, Sd) UCL	0.084003
		97.5% Chebyshev (Mean, Sd) UCL	0.085389
		99% Chebyshev (Mean, Sd) UCL	0.088112

Raw Statistics		Normal Distribution Test	
Number of Valid Samples	5	Shapiro-Wilk Test Statistic	0.96078
Number of Unique Samples	5	Shapiro-Wilk 5% Critical Value	0.762
Minimum	0.029	Data are normal at 5% significance level	
Maximum	0.14	95% UCL (Assuming Normal Distribution)	
Mean	0.089	Student's-t UCL	0.13004
Median	0.08	Gamma Distribution Test	
Standard Deviation	0.043046	A-D Test Statistic	0.329065
Variance	0.001853	A-D 5% Critical Value	0.681186
Coefficient of Variation	0.483668	K-S Test Statistic	0.242682
Skewness	-0.295054	K-S 5% Critical Value	0.358436
Gamma Statistics		Data follow gamma distribution at 5% significance level	
k hat	4.102538	95% UCLs (Assuming Gamma Distribution)	
k star (bias corrected)	1.774349	Approximate Gamma UCL	0.171567
Theta hat	0.021694	Adjusted Gamma UCL	0.236174
Theta star	0.050159	Lognormal Distribution Test	
nu hat	41.02538	Shapiro-Wilk Test Statistic	0.887064
nu star	17.74349	Shapiro-Wilk 5% Critical Value	0.762
Approx. Chi Square Value (.05)	9.204384	Data are lognormal at 5% significance level	
Adjusted Level of Significance	0.0086	95% UCLs (Assuming Lognormal Distribution)	
Adjusted Chi Square Value	6.686463	95% H-UCL	0.263702
Log-transformed Statistics		95% Chebyshev (MVUE) UCL	0.198014
Minimum of log data	-3.540459	97.5% Chebyshev (MVUE) UCL	0.244392
Maximum of log data	-1.966113	99% Chebyshev (MVUE) UCL	0.335493
Mean of log data	-2.545917	95% Non-parametric UCLs	
Standard Deviation of log data	0.613971	CLT UCL	0.120665
Variance of log data	0.376961	Adj-CLT UCL (Adjusted for skewness)	0.117951
RECOMMENDATION		Mod-t UCL (Adjusted for skewness)	0.129617
Data are normal (0.05)		Jackknife UCL	0.13004
Use Student's-t UCL		Standard Bootstrap UCL	0.118231
0.13004		Bootstrap-t UCL	0.134875
		Hall's Bootstrap UCL	0.144794
		Percentile Bootstrap UCL	0.116
		BCA Bootstrap UCL	0.124
		95% Chebyshev (Mean, Sd) UCL	0.172913
		97.5% Chebyshev (Mean, Sd) UCL	0.209222
		99% Chebyshev (Mean, Sd) UCL	0.280545

<b>Raw Statistics</b>		<b>Normal Distribution Test</b>	
Number of Valid Samples	5	Shapiro-Wilk Test Statistic	0.952743
Number of Unique Samples	4	Shapiro-Wilk 5% Critical Value	0.762
Minimum	0.52	Data are normal at 5% significance level	
Maximum	0.68	95% UCL (Assuming Normal Distribution)	
Mean	0.606	Student's-t UCL	0.665002
Median	0.59	<b>Gamma Distribution Test</b>	
Standard Deviation	0.061887	A-D Test Statistic	0.28694
Variance	0.00383	A-D 5% Critical Value	0.67808
Coefficient of Variation	0.102124	K-S Test Statistic	0.201903
Skewness	-0.270433	K-S 5% Critical Value	0.35682
<b>Gamma Statistics</b>		Data follow gamma distribution at 5% significance level	
k hat	117.7533	95% UCLs (Assuming Gamma Distribution)	
k star (bias corrected)	47.23464	Approximate Gamma UCL	0.676787
Theta hat	0.005146	Adjusted Gamma UCL	0.711626
Theta star	0.01283	<b>Lognormal Distribution Test</b>	
nu hat	1177.533	Shapiro-Wilk Test Statistic	0.946753
nu star	472.3464	Shapiro-Wilk 5% Critical Value	0.762
Approx.Chi Square Value (.05)	422.9425	Data are lognormal at 5% significance level	
Adjusted Level of Significance	0.0086	95% UCLs (Assuming Lognormal Distribution)	
Adjusted Chi Square Value	402.2365	95% H-UCL	0.67432
<b>Log-transformed Statistics</b>		95% Chebyshev (MVUE) UCL	0.728399
Minimum of log data	-0.653926	97.5% Chebyshev (MVUE) UCL	0.781351
Maximum of log data	-0.385662	99% Chebyshev (MVUE) UCL	0.885365
Mean of log data	-0.505127	<b>95% Non-parametric UCLs</b>	
Standard Deviation of log data	0.103626	CLT UCL	0.651524
Variance of log data	0.010738	Adj-CLT UCL (Adjusted for skewness)	0.647948
<b>RECOMMENDATION</b>		Mod-t UCL (Adjusted for skewness)	0.664445
Data are normal (0.05)		Jackknife UCL	0.665002
Use Student's-t UCL		Standard Bootstrap UCL	N/R
0.665002		Bootstrap-t UCL	N/R
		Hall's Bootstrap UCL	N/R
		Percentile Bootstrap UCL	N/R
		BCA Bootstrap UCL	N/R
		95% Chebyshev (Mean, Sd) UCL	0.72664
		97.5% Chebyshev (Mean, Sd) UCL	0.778841
		99% Chebyshev (Mean, Sd) UCL	0.88138

Raw Statistics		Normal Distribution Test	
Number of Valid Samples	5	Shapiro-Wilk Test Statistic	0.713615
Number of Unique Samples	4	Shapiro-Wilk 5% Critical Value	0.762
Minimum	0.22	Data not normal at 5% significance level	
Maximum	0.47	95% UCL (Assuming Normal Distribution)	
Mean	0.284	Student's-t UCL	0.385928
Median	0.23	Gamma Distribution Test	
Standard Deviation	0.106911	A-D Test Statistic	0.733752
Variance	0.01143	A-D 5% Critical Value	0.678862
Coefficient of Variation	0.376448	K-S Test Statistic	0.316058
Skewness	1.961629	K-S 5% Critical Value	0.35755
Gamma Statistics		Data follow approximate gamma distribution at 5% significance level	
k hat	10.93922	95% UCLs (Assuming Gamma Distribution)	
k star (bias corrected)	4.509021	Approximate Gamma UCL	0.417336
Theta hat	0.025962	Adjusted Gamma UCL	0.500166
Theta star	0.062985	Lognormal Distribution Test	
nu hat	109.3922	Shapiro-Wilk Test Statistic	0.757314
nu star	45.09021	Shapiro-Wilk 5% Critical Value	0.762
Approx. Chi Square Value (.05)	30.6842	Data not lognormal at 5% significance level	
Adjusted Level of Significance	0.0086	95% UCLs (Assuming Lognormal Distribution)	
Adjusted Chi Square Value	25.60276	95% H-UCL	0.424895
Log-transformed Statistics		95% Chebyshev (MVUE) UCL	0.460085
Minimum of log data	-1.514128	97.5% Chebyshev (MVUE) UCL	0.536876
Maximum of log data	-0.755023	99% Chebyshev (MVUE) UCL	0.687716
Mean of log data	-1.305184	95% Non-parametric UCLs	
Standard Deviation of log data	0.323299	CLT UCL	0.362644
Variance of log data	0.104522	Adj-CLT UCL (Adjusted for skewness)	0.407462
RECOMMENDATION		Mod-t UCL (Adjusted for skewness)	0.392919
Assuming gamma distribution (0.05)		Jackknife UCL	0.385928
Use Approximate Gamma UCL		Standard Bootstrap UCL	N/R
0.417336		Bootstrap-t UCL	N/R
		Hall's Bootstrap UCL	N/R
		Percentile Bootstrap UCL	N/R
		BCA Bootstrap UCL	N/R
		95% Chebyshev (Mean, Sd) UCL	0.492408
		97.5% Chebyshev (Mean, Sd) UCL	0.582587
		99% Chebyshev (Mean, Sd) UCL	0.759725

Raw Statistics		Normal Distribution Test	
Number of Valid Samples	5	Shapiro-Wilk Test Statistic	0.862039
Number of Unique Samples	5	Shapiro-Wilk 5% Critical Value	0.762
Minimum	0.315	Data are normal at 5% significance level	
Maximum	1.7	95% UCL (Assuming Normal Distribution)	
Mean	0.927	Student's-t UCL	1.545783
Median	0.8	Gamma Distribution Test	
Standard Deviation	0.649034	A-D Test Statistic	0.450975
Variance	0.421245	A-D 5% Critical Value	0.684029
Coefficient of Variation	0.700144	K-S Test Statistic	0.266757
Skewness	0.297341	K-S 5% Critical Value	0.360227
Gamma Statistics		Data follow gamma distribution at 5% significance level	
k hat	2.231141	95% UCLs (Assuming Gamma Distribution)	
k star (bias corrected)	1.02579	Approximate Gamma UCL	2.317744
Theta hat	0.415483	Adjusted Gamma UCL	3.672797
Theta star	0.903694	Lognormal Distribution Test	
nu hat	22.31141	Shapiro-Wilk Test Statistic	0.84833
nu star	10.2579	Shapiro-Wilk 5% Critical Value	0.762
Approx. Chi Square Value (.05)	4.102727	Data are lognormal at 5% significance level	
Adjusted Level of Significance	0.0086	95% UCLs (Assuming Lognormal Distribution)	
Adjusted Chi Square Value	2.589054	95% H-UCL	5.34426
Log-transformed Statistics		95% Chebyshev (MVUE) UCL	2.381461
Minimum of log data	-1.155183	97.5% Chebyshev (MVUE) UCL	3.006092
Maximum of log data	0.530628	99% Chebyshev (MVUE) UCL	4.233059
Mean of log data	-0.316333	95% Non-parametric UCLs	
Standard Deviation of log data	0.810584	CLT UCL	1.40443
Variance of log data	0.657046	Adj-CLT UCL (Adjusted for skewness)	1.445671
RECOMMENDATION		Mod-t UCL (Adjusted for skewness)	1.552216
Data are normal (0.05)		Jackknife UCL	1.545783
Use Student's-t UCL		Standard Bootstrap UCL	1.34878
1.545783		Bootstrap-t UCL	1.949311
		Hall's Bootstrap UCL	1.334085
		Percentile Bootstrap UCL	1.383
		BCA Bootstrap UCL	1.3
		95% Chebyshev (Mean, Sd) UCL	2.1922
		97.5% Chebyshev (Mean, Sd) UCL	2.739653
		99% Chebyshev (Mean, Sd) UCL	3.815019

Raw Statistics		Normal Distribution Test	
Number of Valid Samples	5	Shapiro-Wilk Test Statistic	0.752877
Number of Unique Samples	5	Shapiro-Wilk 5% Critical Value	0.762
Minimum	0.0315	Data not normal at 5% significance level	
Maximum	0.24	95% UCL (Assuming Normal Distribution)	
Mean	0.0905	Student's-t UCL	0.172461
Median	0.065	Gamma Distribution Test	
Standard Deviation	0.085968	A-D Test Statistic	0.440268
Variance	0.007391	A-D 5% Critical Value	0.684969
Coefficient of Variation	0.949923	K-S Test Statistic	0.266727
Skewness	1.938814	K-S 5% Critical Value	0.360791
Gamma Statistics		Data follow gamma distribution at 5% significance level	
k hat	1.866208	95% UCLs (Assuming Gamma Distribution)	
k star (bias corrected)	0.879816	Approximate Gamma UCL	0.248453
Theta hat	0.048494	Adjusted Gamma UCL	0.414776
Theta star	0.102862	Lognormal Distribution Test	
nu hat	18.66208	Shapiro-Wilk Test Statistic	0.909436
nu star	8.798164	Shapiro-Wilk 5% Critical Value	0.762
Approx. Chi Square Value (.05)	3.204762	Data are lognormal at 5% significance level	
Adjusted Level of Significance	0.0086	95% UCLs (Assuming Lognormal Distribution)	
Adjusted Chi Square Value	1.919672	95% H-UCL	0.491543
Log-transformed Statistics		95% Chebyshev (MVUE) UCL	0.220432
Minimum of log data	-3.457768	97.5% Chebyshev (MVUE) UCL	0.278197
Maximum of log data	-1.427116	99% Chebyshev (MVUE) UCL	0.391664
Mean of log data	-2.693643	95% Non-parametric UCLs	
Standard Deviation of log data	0.80861	CLT UCL	0.153738
Variance of log data	0.653849	Adj-CLT UCL (Adjusted for skewness)	0.189357
RECOMMENDATION		Mod-t UCL (Adjusted for skewness)	0.178017
Data follow gamma distribution (0.05)		Jackknife UCL	0.172461
Use Approximate Gamma UCL		Standard Bootstrap UCL	0.148408
		Bootstrap-t UCL	0.308553
		Hall's Bootstrap UCL	0.434494
		Percentile Bootstrap UCL	0.1575
		BCA Bootstrap UCL	0.173
		95% Chebyshev (Mean, Sd) UCL	0.258083
		97.5% Chebyshev (Mean, Sd) UCL	0.330596
		99% Chebyshev (Mean, Sd) UCL	0.473034

Recommen 0.248453

Raw Statistics		Normal Distribution Test	
Number of Valid Samples	5	Shapiro-Wilk Test Statistic	0.747911
Number of Unique Samples	5	Shapiro-Wilk 5% Critical Value	0.762
Minimum	2.8	Data not normal at 5% significance level	
Maximum	150	95% UCL (Assuming Normal Distribution)	
Mean	43.28	Student's-t UCL	103.961
Median	4.4	Gamma Distribution Test	
Standard Deviation	63.64756	A-D Test Statistic	0.580305
Variance	4051.012	A-D 5% Critical Value	0.709178
Coefficient of Variation	1.4706	K-S Test Statistic	0.367224
Skewness	1.668158	K-S 5% Critical Value	0.370926
Gamma Statistics		Data follow gamma distribution at 5% significance level	
k hat	0.535049	95% UCLs (Assuming Gamma Distribution)	
k star (bias corrected)	0.347353	Approximate Gamma UCL	286.1931
Theta hat	80.88974	Adjusted Gamma UCL	740.6269
Theta star	124.5994	Lognormal Distribution Test	
nu hat	5.350493	Shapiro-Wilk Test Statistic	0.829339
nu star	3.473531	Shapiro-Wilk 5% Critical Value	0.762
Approx. Chi Square Value (.05)	0.52529	Data are lognormal at 5% significance level	
Adjusted Level of Significance	0.0086	95% UCLs (Assuming Lognormal Distribution)	
Adjusted Chi Square Value	0.202983	95% H-UCL	130030
Log-transformed Statistics		95% Chebyshev (MVUE) UCL	158.8972
Minimum of log data	1.029619	97.5% Chebyshev (MVUE) UCL	210.4543
Maximum of log data	5.010635	99% Chebyshev (MVUE) UCL	311.7283
Mean of log data	2.592855	95% Non-parametric UCLs	
Standard Deviation of log data	1.79342	CLT UCL	90.0992
Variance of log data	3.216356	Adj-CLT UCL (Adjusted for skewness)	112.7889
RECOMMENDATION		Mod-t UCL (Adjusted for skewness)	107.5001
Data follow gamma distribution (0.05)		Jackknife UCL	103.961
Use Approximate Gamma UCL		Standard Bootstrap UCL	85.58052
		Bootstrap-t UCL	3164.707
		Hall's Bootstrap UCL	1830.689
		Percentile Bootstrap UCL	91.44
		BCA Bootstrap UCL	112
		95% Chebyshev (Mean, Sd) UCL	167.3519
		97.5% Chebyshev (Mean, Sd) UCL	221.038
		99% Chebyshev (Mean, Sd) UCL	326.4938

Recommender 286.1931

<b>Raw Statistics</b>		<b>Normal Distribution Test</b>	
Number of Valid Samples	5	Shapiro-Wilk Test Statistic	0.852229
Number of Unique Samples	5	Shapiro-Wilk 5% Critical Value	0.762
Minimum	0.26	Data are normal at 5% significance level	
Maximum	0.57	95% UCL (Assuming Normal Distribution)	
Mean	0.396	Student's-t UCL	0.528552
Median	0.32	<b>Gamma Distribution Test</b>	
Standard Deviation	0.139032	A-D Test Statistic	0.484391
Variance	0.01933	A-D 5% Critical Value	0.678871
Coefficient of Variation	0.351092	K-S Test Statistic	0.312856
Skewness	0.555685	K-S 5% Critical Value	0.357569
<b>Gamma Statistics</b>		Data follow gamma distribution at 5% significance level	
k hat	10.49317	95% UCLs (Assuming Gamma Distribution)	
k star (bias corrected)	4.330602	Approximate Gamma UCL	0.587024
Theta hat	0.037739	Adjusted Gamma UCL	0.706574
Theta star	0.091442	<b>Lognormal Distribution Test</b>	
nu hat	104.9317	Shapiro-Wilk Test Statistic	0.875256
nu star	43.30602	Shapiro-Wilk 5% Critical Value	0.762
Approx.Chi Square Value (.05)	29.21379	Data are lognormal at 5% significance level	
Adjusted Level of Significance	0.0086	95% UCLs (Assuming Lognormal Distribution)	
Adjusted Chi Square Value	24.2709	95% H-UCL	0.61787
<b>Log-transformed Statistics</b>		95% Chebyshev (MVUE) UCL	0.660933
Minimum of log data	-1.347074	97.5% Chebyshev (MVUE) UCL	0.775745
Maximum of log data	-0.562119	99% Chebyshev (MVUE) UCL	1.001272
Mean of log data	-0.974747	<b>95% Non-parametric UCLs</b>	
Standard Deviation of log data	0.345516	CLT UCL	0.498272
Variance of log data	0.119381	Adj-CLT UCL (Adjusted for skewness)	0.514783
<b>RECOMMENDATION</b>		Mod-t UCL (Adjusted for skewness)	0.531127
Data are normal (0.05)		Jackknife UCL	0.528552
Use Student's-t UCL		Standard Bootstrap UCL	0.489329
0.528552		Bootstrap-t UCL	0.905605
		Hall's Bootstrap UCL	2.105572
		Percentile Bootstrap UCL	0.49
		BCA Bootstrap UCL	0.51
		95% Chebyshev (Mean, Sd) UCL	0.667024
		97.5% Chebyshev (Mean, Sd) UCL	0.784296
		99% Chebyshev (Mean, Sd) UCL	1.014655

## **A-1.8 Soil Gas - South Parcel - Skateland**

Raw Statistics		Normal Distribution Test	
Number of Valid Samples	7	Shapiro-Wilk Test Statistic	0.695817
Number of Unique Samples	7	Shapiro-Wilk 5% Critical Value	0.803
Minimum	240	Data not normal at 5% significance level	
Maximum	330000	95% UCL (Assuming Normal Distribution)	
Mean	80204.29	Student's-t UCL	177230.7
Median	850	Gamma Distribution Test	
Standard Deviation	132107	A-D Test Statistic	0.691304
Variance	1.75E+10	A-D 5% Critical Value	0.797204
Coefficient of Variation	1.647132	K-S Test Statistic	0.337816
Skewness	1.533694	K-S 5% Critical Value	0.337497
Gamma Statistics		Data follow approximate gamma distribution at 5% significance level	
k hat	0.264603	95% UCLs (Assuming Gamma Distribution)	
k star (bias corrected)	0.24644	Approximate Gamma UCL	535055.5
Theta hat	303111.7	Adjusted Gamma UCL	1014061
Theta star	325451.8	Lognormal Distribution Test	
nu hat	3.704442	Shapiro-Wilk Test Statistic	0.837973
nu star	3.450158	Shapiro-Wilk 5% Critical Value	0.803
Approx.Chi Square Value (.05)	0.517175	Data are lognormal at 5% significance level	
Adjusted Level of Significance	0.01584	95% UCLs (Assuming Lognormal Distribution)	
Adjusted Chi Square Value	0.27288	95% H-UCL	1.18E+11
Log-transformed Statistics		95% Chebyshev (MVUE) UCL	492187.4
Minimum of log data	5.480639	97.5% Chebyshev (MVUE) UCL	661056.1
Maximum of log data	12.70685	99% Chebyshev (MVUE) UCL	992765.9
Mean of log data	8.632502	95% Non-parametric UCLs	
Standard Deviation of log data	3.016715	CLT UCL	162334.7
Variance of log data	9.100569	Adj-CLT UCL (Adjusted for skewness)	193262.4
RECOMMENDATION		Mod-t UCL (Adjusted for skewness)	182054.8
Assuming gamma distribution (0.05)		Jackknife UCL	177230.7
Use Adjusted Gamma UCL		Standard Bootstrap UCL	153460.4
		Bootstrap-t UCL	1006789
		Hall's Bootstrap UCL	1453257
		Percentile Bootstrap UCL	159835.7
		BCA Bootstrap UCL	149934.3
		95% Chebyshev (Mean, Sd) UCL	297851.8
		97.5% Chebyshev (Mean, Sd) UCL	392028
		99% Chebyshev (Mean, Sd) UCL	577019

Recommen 1014061

Raw Statistics		Normal Distribution Test	
Number of Valid Samples	7	Shapiro-Wilk Test Statistic	0.697408
Number of Unique Samples	7	Shapiro-Wilk 5% Critical Value	0.803
Minimum	21	Data not normal at 5% significance level	
Maximum	210000	95% UCL (Assuming Normal Distribution)	
Mean	46487.29	Student's-t UCL	103694.3
Median	2100	Gamma Distribution Test	
Standard Deviation	77890.71	A-D Test Statistic	0.316661
Variance	6.07E+09	A-D 5% Critical Value	0.792758
Coefficient of Variation	1.675527	K-S Test Statistic	0.242205
Skewness	1.987839	K-S 5% Critical Value	0.33668
Gamma Statistics		Data follow gamma distribution at 5% significance level	
k hat	0.276612	95% UCLs (Assuming Gamma Distribution)	
k star (bias corrected)	0.253302	Approximate Gamma UCL	299260.5
Theta hat	168059.3	Adjusted Gamma UCL	562807.9
Theta star	183524.9	Lognormal Distribution Test	
nu hat	3.872573	Shapiro-Wilk Test Statistic	0.947015
nu star	3.546232	Shapiro-Wilk 5% Critical Value	0.803
Approx. Chi Square Value (.05)	0.550874	Data are lognormal at 5% significance level	
Adjusted Level of Significance	0.01584	95% UCLs (Assuming Lognormal Distribution)	
Adjusted Chi Square Value	0.292915	95% H-UCL	1.23E+12
Log-transformed Statistics		95% Chebyshev (MVUE) UCL	485392.5
Minimum of log data	3.044522	97.5% Chebyshev (MVUE) UCL	652911.2
Maximum of log data	12.25486	99% Chebyshev (MVUE) UCL	981969.3
Mean of log data	8.220853	95% Non-parametric UCLs	
Standard Deviation of log data	3.255998	CLT UCL	94911.64
Variance of log data	10.60152	Adj-CLT UCL (Adjusted for skewness)	118546.3
RECOMMENDATION		Mod-t UCL (Adjusted for skewness)	107380.9
Data follow gamma distribution (0.05)		Jackknife UCL	103694.3
Use Adjusted Gamma UCL		Standard Bootstrap UCL	91651.68
Recommender 562807.9		Bootstrap-t UCL	317671.9
		Hall's Bootstrap UCL	380058.5
		Percentile Bootstrap UCL	98860.14
		BCA Bootstrap UCL	92098.57
		95% Chebyshev (Mean, Sd) UCL	174812.9
		97.5% Chebyshev (Mean, Sd) UCL	230339.5
		99% Chebyshev (Mean, Sd) UCL	339410.8

Raw Statistics		Normal Distribution Test	
Number of Valid Samples	7	Shapiro-Wilk Test Statistic	0.652126
Number of Unique Samples	7	Shapiro-Wilk 5% Critical Value	0.803
Minimum	0.7	Data not normal at 5% significance level	
Maximum	950	95% UCL (Assuming Normal Distribution)	
Mean	194.4143	Student's-t UCL	454.8456
Median	5.5	Gamma Distribution Test	
Standard Deviation	354.5923	A-D Test Statistic	0.507035
Variance	125735.7	A-D 5% Critical Value	0.789593
Coefficient of Variation	1.8239	K-S Test Statistic	0.290797
Skewness	2.113274	K-S 5% Critical Value	0.336099
Gamma Statistics		Data follow gamma distribution at 5% significance level	
k hat	0.285162	95% UCLs (Assuming Gamma Distribution)	
k star (bias corrected)	0.258188	Approximate Gamma UCL	1221.29
Theta hat	681.7679	Adjusted Gamma UCL	2283.71
Theta star	752.9956	Lognormal Distribution Test	
nu hat	3.992268	Shapiro-Wilk Test Statistic	0.913961
nu star	3.614629	Shapiro-Wilk 5% Critical Value	0.803
Approx. Chi Square Value (.05)	0.575404	Data are lognormal at 5% significance level	
Adjusted Level of Significance	0.01584	95% UCLs (Assuming Lognormal Distribution)	
Adjusted Chi Square Value	0.307717	95% H-UCL	31279201
Log-transformed Statistics		95% Chebyshev (MVUE) UCL	1023.172
Minimum of log data	-0.356675	97.5% Chebyshev (MVUE) UCL	1371.686
Maximum of log data	6.856462	99% Chebyshev (MVUE) UCL	2056.273
Mean of log data	2.831756	95% Non-parametric UCLs	
Standard Deviation of log data	2.787792	CLT UCL	414.863
Variance of log data	7.771782	Adj-CLT UCL (Adjusted for skewness)	529.2476
RECOMMENDATION		Mod-t UCL (Adjusted for skewness)	472.6873
Data follow gamma distribution (0.05)		Jackknife UCL	454.8456
Use Adjusted Gamma UCL		Standard Bootstrap UCL	398.1859
Recommender 2283.71		Bootstrap-t UCL	2913.757
		Hall's Bootstrap UCL	3385.239
		Percentile Bootstrap UCL	417.3857
		BCA Bootstrap UCL	409.5714
		95% Chebyshev (Mean, Sd) UCL	778.6083
		97.5% Chebyshev (Mean, Sd) UCL	1031.389
		99% Chebyshev (Mean, Sd) UCL	1527.929

Raw Statistics		Normal Distribution Test	
Number of Valid Samples	6	Shapiro-Wilk Test Statistic	0.61572
Number of Unique Samples	6	Shapiro-Wilk 5% Critical Value	0.788
Minimum	4.2	Data not normal at 5% significance level	
Maximum	335	95% UCL (Assuming Normal Distribution)	
Mean	72.11667	Student's-t UCL	179.7273
Median	11.5	Gamma Distribution Test	
Standard Deviation	130.8113	A-D Test Statistic	0.666145
Variance	17111.6	A-D 5% Critical Value	0.736167
Coefficient of Variation	1.813885	K-S Test Statistic	0.348947
Skewness	2.293491	K-S 5% Critical Value	0.348694
Gamma Statistics		Data follow approximate gamma distribution at 5% significance level	
k hat	0.497943	95% UCLs (Assuming Gamma Distribution)	
k star (bias corrected)	0.360083	Approximate Gamma UCL	365.688
Theta hat	144.8291	Adjusted Gamma UCL	725.5864
Theta star	200.2781	Lognormal Distribution Test	
nu hat	5.975318	Shapiro-Wilk Test Statistic	0.880069
nu star	4.320992	Shapiro-Wilk 5% Critical Value	0.788
Approx. Chi Square Value (.05)	0.852135	Data are lognormal at 5% significance level	
Adjusted Level of Significance	0.01222	95% UCLs (Assuming Lognormal Distribution)	
Adjusted Chi Square Value	0.429467	95% H-UCL	13668.69
Log-transformed Statistics		95% Chebyshev (MVUE) UCL	209.7471
Minimum of log data	1.435085	97.5% Chebyshev (MVUE) UCL	276.2763
Maximum of log data	5.814131	99% Chebyshev (MVUE) UCL	406.9599
Mean of log data	3.001859	95% Non-parametric UCLs	
Standard Deviation of log data	1.676483	CLT UCL	159.9576
Variance of log data	2.810597	Adj-CLT UCL (Adjusted for skewness)	213.3859
RECOMMENDATION		Mod-t UCL (Adjusted for skewness)	188.061
Assuming gamma distribution (0.05)		Jackknife UCL	179.7273
Use Adjusted Gamma UCL		Standard Bootstrap UCL	153.6617
Recommen 725.5864		Bootstrap-t UCL	2429.004
		Hall's Bootstrap UCL	1299.84
		Percentile Bootstrap UCL	171.8667
		BCA Bootstrap UCL	226.0333
		95% Chebyshev (Mean, Sd) UCL	304.8971
		97.5% Chebyshev (Mean, Sd) UCL	405.6214
		99% Chebyshev (Mean, Sd) UCL	603.4748

Raw Statistics		Normal Distribution Test	
Number of Valid Samples	6	Shapiro-Wilk Test Statistic	0.614113
Number of Unique Samples	6	Shapiro-Wilk 5% Critical Value	0.788
Minimum	0.7	Data not normal at 5% significance level	
Maximum	335	95% UCL (Assuming Normal Distribution)	
Mean	68.41667	Student's-t UCL	177.8033
Median	4.05	Gamma Distribution Test	
Standard Deviation	132.9702	A-D Test Statistic	0.579251
Variance	17681.07	A-D 5% Critical Value	0.762709
Coefficient of Variation	1.943535	K-S Test Statistic	0.32735
Skewness	2.271768	K-S 5% Critical Value	0.355728
Gamma Statistics		Data follow gamma distribution at 5% significance level	
k hat	0.325763	95% UCLs (Assuming Gamma Distribution)	
k star (bias corrected)	0.273992	Approximate Gamma UCL	486.502
Theta hat	210.0201	Adjusted Gamma UCL	1068.72
Theta star	249.7028	Lognormal Distribution Test	
nu hat	3.909151	Shapiro-Wilk Test Statistic	0.911376
nu star	3.287909	Shapiro-Wilk 5% Critical Value	0.788
Approx. Chi Square Value (.05)	0.462378	Data are lognormal at 5% significance level	
Adjusted Level of Significance	0.01222	95% UCLs (Assuming Lognormal Distribution)	
Adjusted Chi Square Value	0.210483	95% H-UCL	3267899
Log-transformed Statistics		95% Chebyshev (MVUE) UCL	242.0468
Minimum of log data	-0.356675	97.5% Chebyshev (MVUE) UCL	323.2909
Maximum of log data	5.814131	99% Chebyshev (MVUE) UCL	482.8792
Mean of log data	2.137122	95% Non-parametric UCLs	
Standard Deviation of log data	2.368706	CLT UCL	157.7073
Variance of log data	5.610768	Adj-CLT UCL (Adjusted for skewness)	211.503
RECOMMENDATION		Mod-t UCL (Adjusted for skewness)	186.1943
Data follow gamma distribution (0.05)		Jackknife UCL	177.8033
Use Adjusted Gamma UCL		Standard Bootstrap UCL	148.8971
Recommender 1068.72		Bootstrap-t UCL	4591.362
		Hall's Bootstrap UCL	2366.681
		Percentile Bootstrap UCL	168.65
		BCA Bootstrap UCL	224.3667
		95% Chebyshev (Mean, Sd) UCL	305.0388
		97.5% Chebyshev (Mean, Sd) UCL	407.4254
		99% Chebyshev (Mean, Sd) UCL	608.5441

Raw Statistics		Normal Distribution Test	
Number of Valid Samples	6	Shapiro-Wilk Test Statistic	0.614022
Number of Unique Samples	6	Shapiro-Wilk 5% Critical Value	0.788
Minimum	0.7	Data not normal at 5% significance level	
Maximum	335	95% UCL (Assuming Normal Distribution)	
Mean	68.38333	Student's-t UCL	177.7862
Median	3.95	Gamma Distribution Test	
Standard Deviation	132.99	A-D Test Statistic	0.585202
Variance	17686.34	A-D 5% Critical Value	0.762973
Coefficient of Variation	1.944772	K-S Test Statistic	0.325818
Skewness	2.271548	K-S 5% Critical Value	0.355798
Gamma Statistics		Data follow gamma distribution at 5% significance level	
k hat	0.324049	95% UCLs (Assuming Gamma Distribution)	
k star (bias corrected)	0.273136	Approximate Gamma UCL	488.3134
Theta hat	211.0278	Adjusted Gamma UCL	1073.492
Theta star	250.3641	Lognormal Distribution Test	
nu hat	3.888586	Shapiro-Wilk Test Statistic	0.90761
nu star	3.277627	Shapiro-Wilk 5% Critical Value	0.788
Approx. Chi Square Value (.05)	0.458998	Data are lognormal at 5% significance level	
Adjusted Level of Significance	0.01222	95% UCLs (Assuming Lognormal Distribution)	
Adjusted Chi Square Value	0.208791	95% H-UCL	3521546
Log-transformed Statistics		95% Chebyshev (MVUE) UCL	241.7699
Minimum of log data	-0.356675	97.5% Chebyshev (MVUE) UCL	322.9557
Maximum of log data	5.814131	99% Chebyshev (MVUE) UCL	482.4295
Mean of log data	2.123781	95% Non-parametric UCLs	
Standard Deviation of log data	2.376903	CLT UCL	157.6873
Variance of log data	5.649667	Adj-CLT UCL (Adjusted for skewness)	211.4858
RECOMMENDATION		Mod-t UCL (Adjusted for skewness)	186.1777
Data follow gamma distribution (0.05)		Jackknife UCL	177.7862
Use Adjusted Gamma UCL		Standard Bootstrap UCL	149.2465
Recommender 1073.492		Bootstrap-t UCL	4550.124
		Hall's Bootstrap UCL	2755.485
		Percentile Bootstrap UCL	168.4667
		BCA Bootstrap UCL	200
		95% Chebyshev (Mean, Sd) UCL	305.0408
		97.5% Chebyshev (Mean, Sd) UCL	407.4427
		99% Chebyshev (Mean, Sd) UCL	608.5913

Raw Statistics		Normal Distribution Test	
Number of Valid Samples	6	Shapiro-Wilk Test Statistic	0.616568
Number of Unique Samples	6	Shapiro-Wilk 5% Critical Value	0.788
Minimum	35	Data not normal at 5% significance level	
Maximum	1350	95% UCL (Assuming Normal Distribution)	
Mean	306.3333	Student's-t UCL	733.0546
Median	70	Gamma Distribution Test	
Standard Deviation	518.7218	A-D Test Statistic	0.723847
Variance	269072.3	A-D 5% Critical Value	0.727546
Coefficient of Variation	1.693325	K-S Test Statistic	0.339183
Skewness	2.30422	K-S 5% Critical Value	0.345727
Gamma Statistics		Data follow gamma distribution at 5% significance level	
k hat	0.639699	95% UCLs (Assuming Gamma Distribution)	
k star (bias corrected)	0.43096	Approximate Gamma UCL	1286.058
Theta hat	478.8713	Adjusted Gamma UCL	2359.24
Theta star	710.8154	Lognormal Distribution Test	
nu hat	7.676384	Shapiro-Wilk Test Statistic	0.857213
nu star	5.171525	Shapiro-Wilk 5% Critical Value	0.788
Approx. Chi Square Value (.05)	1.231835	Data are lognormal at 5% significance level	
Adjusted Level of Significance	0.01222	95% UCLs (Assuming Lognormal Distribution)	
Adjusted Chi Square Value	0.671492	95% H-UCL	11161.26
Log-transformed Statistics		95% Chebyshev (MVUE) UCL	823.1148
Minimum of log data	3.555348	97.5% Chebyshev (MVUE) UCL	1073.333
Maximum of log data	7.20786	99% Chebyshev (MVUE) UCL	1564.839
Mean of log data	4.767779	95% Non-parametric UCLs	
Standard Deviation of log data	1.393309	CLT UCL	654.6595
Variance of log data	1.941311	Adj-CLT UCL (Adjusted for skewness)	867.5164
RECOMMENDATION		Mod-t UCL (Adjusted for skewness)	766.256
Data follow gamma distribution (0.05)		Jackknife UCL	733.0546
Use Approximate Gamma UCL		Standard Bootstrap UCL	614.7376
		Bootstrap-t UCL	7881.035
		Hall's Bootstrap UCL	4170.173
		Percentile Bootstrap UCL	701
		BCA Bootstrap UCL	955.3333
		95% Chebyshev (Mean, Sd) UCL	1229.405
		97.5% Chebyshev (Mean, Sd) UCL	1628.82
		99% Chebyshev (Mean, Sd) UCL	2413.391

1286.058

<b>Raw Statistics</b>		<b>Normal Distribution Test</b>	
Number of Valid Samples	7	Shapiro-Wilk Test Statistic	0.651693
Number of Unique Samples	7	Shapiro-Wilk 5% Critical Value	0.803
Minimum	1.15	Data not normal at 5% significance level	
Maximum	950	95% UCL (Assuming Normal Distribution)	
Mean	194.9071	Student's-t UCL	455.1103
Median	5.5	<b>Gamma Distribution Test</b>	
Standard Deviation	354.2816	A-D Test Statistic	0.556536
Variance	125515.5	A-D 5% Critical Value	0.782877
Coefficient of Variation	1.817694	K-S Test Statistic	0.312809
Skewness	2.114983	K-S 5% Critical Value	0.334795
<b>Gamma Statistics</b>		Data follow gamma distribution at 5% significance level	
k hat	0.307515	95% UCLs (Assuming Gamma Distribution)	
k star (bias corrected)	0.270961	Approximate Gamma UCL	1152.452
Theta hat	633.8141	Adjusted Gamma UCL	2121.81
Theta star	719.3187	<b>Lognormal Distribution Test</b>	
nu hat	4.305205	Shapiro-Wilk Test Statistic	0.902976
nu star	3.793451	Shapiro-Wilk 5% Critical Value	0.803
Approx. Chi Square Value (.05)	0.641563	Data are lognormal at 5% significance level	
Adjusted Level of Significance	0.01584	95% UCLs (Assuming Lognormal Distribution)	
Adjusted Chi Square Value	0.348462	95% H-UCL	5193376
<b>Log-transformed Statistics</b>		95% Chebyshev (MVUE) UCL	906.3395
Minimum of log data	0.139762	97.5% Chebyshev (MVUE) UCL	1212.548
Maximum of log data	6.856462	99% Chebyshev (MVUE) UCL	1814.036
Mean of log data	3.039177	<b>95% Non-parametric UCLs</b>	
Standard Deviation of log data	2.584493	CLT UCL	415.1627
Variance of log data	6.679604	Adj-CLT UCL (Adjusted for skewness)	529.5395
<b>RECOMMENDATION</b>		Mod-t UCL (Adjusted for skewness)	472.9508
Data follow gamma distribution (0.05)		Jackknife UCL	455.1103
Use Adjusted Gamma UCL		Standard Bootstrap UCL	396.2452
Recommender 2121.81		Bootstrap-t UCL	2278.065
		Hall's Bootstrap UCL	3382.39
		Percentile Bootstrap UCL	418.3714
		BCA Bootstrap UCL	409.25
		95% Chebyshev (Mean, Sd) UCL	778.5893
		97.5% Chebyshev (Mean, Sd) UCL	1031.149
		99% Chebyshev (Mean, Sd) UCL	1527.254

Raw Statistics		Normal Distribution Test	
Number of Valid Samples	6	Shapiro-Wilk Test Statistic	0.614561
Number of Unique Samples	6	Shapiro-Wilk 5% Critical Value	0.788
Minimum	0.7	Data not normal at 5% significance level	
Maximum	335	95% UCL (Assuming Normal Distribution)	
Mean	68.58333	Student's-t UCL	177.889
Median	4.55	Gamma Distribution Test	
Standard Deviation	132.8718	A-D Test Statistic	0.557741
Variance	17654.91	A-D 5% Critical Value	0.761613
Coefficient of Variation	1.937377	K-S Test Statistic	0.333664
Skewness	2.272812	K-S 5% Critical Value	0.355437
Gamma Statistics		Data follow gamma distribution at 5% significance level	
k hat	0.332873	95% UCLs (Assuming Gamma Distribution)	
k star (bias corrected)	0.277548	Approximate Gamma UCL	479.3523
Theta hat	206.0344	Adjusted Gamma UCL	1049.644
Theta star	247.1046	Lognormal Distribution Test	
nu hat	3.994479	Shapiro-Wilk Test Statistic	0.923553
nu star	3.330573	Shapiro-Wilk 5% Critical Value	0.788
Approx. Chi Square Value (.05)	0.476522	Data are lognormal at 5% significance level	
Adjusted Level of Significance	0.01222	95% UCLs (Assuming Lognormal Distribution)	
Adjusted Chi Square Value	0.217618	95% H-UCL	2534619
Log-transformed Statistics		95% Chebyshev (MVUE) UCL	244.7871
Minimum of log data	-0.356675	97.5% Chebyshev (MVUE) UCL	326.8247
Maximum of log data	5.814131	99% Chebyshev (MVUE) UCL	487.9716
Mean of log data	2.191359	95% Non-parametric UCLs	
Standard Deviation of log data	2.339788	CLT UCL	157.8079
Variance of log data	5.474608	Adj-CLT UCL (Adjusted for skewness)	211.5884
RECOMMENDATION		Mod-t UCL (Adjusted for skewness)	186.2777
Data follow gamma distribution (0.05)		Jackknife UCL	177.889
Use Adjusted Gamma UCL		Standard Bootstrap UCL	150.7951
Recommender 1049.644		Bootstrap-t UCL	4632.425
		Hall's Bootstrap UCL	2054.859
		Percentile Bootstrap UCL	168.9833
		BCA Bootstrap UCL	189.45
		95% Chebyshev (Mean, Sd) UCL	305.0304
		97.5% Chebyshev (Mean, Sd) UCL	407.3412
		99% Chebyshev (Mean, Sd) UCL	608.3111

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Raw Statistics		Normal Distribution Test	
Number of Valid Samples	7	Shapiro-Wilk Test Statistic	0.652091
Number of Unique Samples	7	Shapiro-Wilk 5% Critical Value	0.803
Minimum	0.7	Data not normal at 5% significance level	
Maximum	950	95% UCL (Assuming Normal Distribution)	
Mean	194.3429	Student's-t UCL	454.8073
Median	5.5	Gamma Distribution Test	
Standard Deviation	354.6373	A-D Test Statistic	0.515704
Variance	125767.6	A-D 5% Critical Value	0.79054
Coefficient of Variation	1.824803	K-S Test Statistic	0.288137
Skewness	2.113027	K-S 5% Critical Value	0.336273
Gamma Statistics		Data follow gamma distribution at 5% significance level	
k hat	0.282604	95% UCLs (Assuming Gamma Distribution)	
k star (bias corrected)	0.256726	Approximate Gamma UCL	1229.712
Theta hat	687.6852	Adjusted Gamma UCL	2303.442
Theta star	757.004	Lognormal Distribution Test	
nu hat	3.956461	Shapiro-Wilk Test Statistic	0.908262
nu star	3.594168	Shapiro-Wilk 5% Critical Value	0.803
Approx. Chi Square Value (.05)	0.56802	Data are lognormal at 5% significance level	
Adjusted Level of Significance	0.01584	95% UCLs (Assuming Lognormal Distribution)	
Adjusted Chi Square Value	0.303242	95% H-UCL	37293544
Log-transformed Statistics		95% Chebyshev (MVUE) UCL	1029.319
Minimum of log data	-0.356675	97.5% Chebyshev (MVUE) UCL	1380.17
Maximum of log data	6.856462	99% Chebyshev (MVUE) UCL	2069.35
Mean of log data	2.80571	95% Non-parametric UCLs	
Standard Deviation of log data	2.807465	CLT UCL	414.8196
Variance of log data	7.88186	Adj-CLT UCL (Adjusted for skewness)	529.2053
RECOMMENDATION		Mod-t UCL (Adjusted for skewness)	472.6491
Data follow gamma distribution (0.05)		Jackknife UCL	454.8073
Use Adjusted Gamma UCL		Standard Bootstrap UCL	400.1701
Recommen 2303.442		Bootstrap-t UCL	2230.46
		Hall's Bootstrap UCL	3376.007
		Percentile Bootstrap UCL	425.0714
		BCA Bootstrap UCL	408.7714
		95% Chebyshev (Mean, Sd) UCL	778.611
		97.5% Chebyshev (Mean, Sd) UCL	1031.424
		99% Chebyshev (Mean, Sd) UCL	1528.027

Raw Statistics		Normal Distribution Test	
Number of Valid Samples	7	Shapiro-Wilk Test Statistic	0.683553
Number of Unique Samples	7	Shapiro-Wilk 5% Critical Value	0.803
Minimum	0.7	Data not normal at 5% significance level	
Maximum	1900	95% UCL (Assuming Normal Distribution)	
Mean	414.6714	Student's-t UCL	941.0992
Median	5.5	Gamma Distribution Test	
Standard Deviation	716.7619	A-D Test Statistic	0.548638
Variance	513747.6	A-D 5% Critical Value	0.799007
Coefficient of Variation	1.728506	K-S Test Statistic	0.318129
Skewness	1.928891	K-S 5% Critical Value	0.337828
Gamma Statistics		Data follow gamma distribution at 5% significance level	
k hat	0.259732	95% UCLs (Assuming Gamma Distribution)	
k star (bias corrected)	0.243657	Approximate Gamma UCL	2807.886
Theta hat	1596.533	Adjusted Gamma UCL	5337.573
Theta star	1701.868	Lognormal Distribution Test	
nu hat	3.636253	Shapiro-Wilk Test Statistic	0.887023
nu star	3.411192	Shapiro-Wilk 5% Critical Value	0.803
Approx. Chi Square Value (.05)	0.503768	Data are lognormal at 5% significance level	
Adjusted Level of Significance	0.01584	95% UCLs (Assuming Lognormal Distribution)	
Adjusted Chi Square Value	0.265013	95% H-UCL	1.81E+09
Log-transformed Statistics		95% Chebyshev (MVUE) UCL	2840.937
Minimum of log data	-0.356675	97.5% Chebyshev (MVUE) UCL	3818.274
Maximum of log data	7.549609	99% Chebyshev (MVUE) UCL	5738.064
Mean of log data	3.30961	95% Non-parametric UCLs	
Standard Deviation of log data	3.118293	CLT UCL	860.2796
Variance of log data	9.72375	Adj-CLT UCL (Adjusted for skewness)	1071.32
RECOMMENDATION		Mod-t UCL (Adjusted for skewness)	974.0172
Data follow gamma distribution (0.05)		Jackknife UCL	941.0992
Use Adjusted Gamma UCL		Standard Bootstrap UCL	811.2207
		Bootstrap-t UCL	4311.064
		Hall's Bootstrap UCL	5323.907
		Percentile Bootstrap UCL	826.5
		BCA Bootstrap UCL	816.6571
		95% Chebyshev (Mean, Sd) UCL	1595.543
		97.5% Chebyshev (Mean, Sd) UCL	2106.507
		99% Chebyshev (Mean, Sd) UCL	3110.197

Recommen 5337.573

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<b>Raw Statistics</b>		<b>Normal Distribution Test</b>	
Number of Valid Samples	6	Shapiro-Wilk Test Statistic	0.613191
Number of Unique Samples	6	Shapiro-Wilk 5% Critical Value	0.788
Minimum	1.15	Data not normal at 5% significance level	
Maximum	335	95% UCL (Assuming Normal Distribution)	
Mean	68.55833	Student's-t UCL	177.8748
Median	4.25	<b>Gamma Distribution Test</b>	
Standard Deviation	132.8849	A-D Test Statistic	0.64039
Variance	17658.4	A-D 5% Critical Value	0.760443
Coefficient of Variation	1.938275	K-S Test Statistic	0.33993
Skewness	2.272794	K-S 5% Critical Value	0.355127
<b>Gamma Statistics</b>		Data follow gamma distribution at 5% significance level	
k hat	0.340464	95% UCLs (Assuming Gamma Distribution)	
k star (bias corrected)	0.281343	Approximate Gamma UCL	470.6104
Theta hat	201.3675	Adjusted Gamma UCL	1026.747
Theta star	243.6824	<b>Lognormal Distribution Test</b>	
nu hat	4.085565	Shapiro-Wilk Test Statistic	0.87751
nu star	3.376116	Shapiro-Wilk 5% Critical Value	0.788
Approx. Chi Square Value (.05)	0.491831	Data are lognormal at 5% significance level	
Adjusted Level of Significance	0.01222	95% UCLs (Assuming Lognormal Distribution)	
Adjusted Chi Square Value	0.225431	95% H-UCL	1112094
<b>Log-transformed Statistics</b>		95% Chebyshev (MVUE) UCL	227.6964
Minimum of log data	0.139762	97.5% Chebyshev (MVUE) UCL	303.6419
Maximum of log data	5.814131	99% Chebyshev (MVUE) UCL	452.8221
Mean of log data	2.243711	<b>95% Non-parametric UCLs</b>	
Standard Deviation of log data	2.255588	CLT UCL	157.7917
Variance of log data	5.087679	Adj-CLT UCL (Adjusted for skewness)	211.5772
<b>RECOMMENDATION</b>		Mod-t UCL (Adjusted for skewness)	186.2642
Data follow gamma distribution (0.05)		Jackknife UCL	177.8748
Use Adjusted Gamma UCL		Standard Bootstrap UCL	146.5342
Recommen 1026.747		Bootstrap-t UCL	4729.711
		Hall's Bootstrap UCL	2213.564
		Percentile Bootstrap UCL	168.6917
		BCA Bootstrap UCL	223.7167
		95% Chebyshev (Mean, Sd) UCL	305.0288
		97.5% Chebyshev (Mean, Sd) UCL	407.3497
		99% Chebyshev (Mean, Sd) UCL	608.3394

Raw Statistics		Normal Distribution Test	
Number of Valid Samples	7	Shapiro-Wilk Test Statistic	0.563285
Number of Unique Samples	7	Shapiro-Wilk 5% Critical Value	0.803
Minimum	3.2	Data not normal at 5% significance level	
Maximum	1900	95% UCL (Assuming Normal Distribution)	
Mean	331.5286	Student's-t UCL	847.146
Median	7	Gamma Distribution Test	
Standard Deviation	702.043	A-D Test Statistic	0.752873
Variance	492864.4	A-D 5% Critical Value	0.787401
Coefficient of Variation	2.117594	K-S Test Statistic	0.319079
Skewness	2.495518	K-S 5% Critical Value	0.335696
Gamma Statistics		Data follow gamma distribution at 5% significance level	
k hat	0.291082	95% UCLs (Assuming Gamma Distribution)	
k star (bias corrected)	0.261571	Approximate Gamma UCL	2048.531
Theta hat	1138.952	Adjusted Gamma UCL	3815.103
Theta star	1267.453	Lognormal Distribution Test	
nu hat	4.07515	Shapiro-Wilk Test Statistic	0.851563
nu star	3.66199	Shapiro-Wilk 5% Critical Value	0.803
Approx. Chi Square Value (.05)	0.592646	Data are lognormal at 5% significance level	
Adjusted Level of Significance	0.01584	95% UCLs (Assuming Lognormal Distribution)	
Adjusted Chi Square Value	0.318223	95% H-UCL	2834652
Log-transformed Statistics		95% Chebyshev (MVUE) UCL	1121.913
Minimum of log data	1.163151	97.5% Chebyshev (MVUE) UCL	1499.034
Maximum of log data	7.549609	99% Chebyshev (MVUE) UCL	2239.815
Mean of log data	3.423053	95% Non-parametric UCLs	
Standard Deviation of log data	2.477939	CLT UCL	767.9861
Variance of log data	6.140184	Adj-CLT UCL (Adjusted for skewness)	1035.414
RECOMMENDATION		Mod-t UCL (Adjusted for skewness)	888.8594
Data follow gamma distribution (0.05)		Jackknife UCL	847.146
Use Adjusted Gamma UCL		Standard Bootstrap UCL	727.231
		Bootstrap-t UCL	10154.45
		Hall's Bootstrap UCL	10483.09
		Percentile Bootstrap UCL	825.7429
		BCA Bootstrap UCL	688.1429
		95% Chebyshev (Mean, Sd) UCL	1488.151
		97.5% Chebyshev (Mean, Sd) UCL	1988.622
		99% Chebyshev (Mean, Sd) UCL	2971.701
Recommender	3815.103		

Raw Statistics		Normal Distribution Test	
Number of Valid Samples	7	Shapiro-Wilk Test Statistic	0.727212
Number of Unique Samples	7	Shapiro-Wilk 5% Critical Value	0.803
Minimum	140	Data not normal at 5% significance level	
Maximum	13000	95% UCL (Assuming Normal Distribution)	
Mean	3250	Student's-t UCL	6600.219
Median	1700	Gamma Distribution Test	
Standard Deviation	4561.517	A-D Test Statistic	0.316923
Variance	20807433	A-D 5% Critical Value	0.745002
Coefficient of Variation	1.403544	K-S Test Statistic	0.190311
Skewness	2.069423	K-S 5% Critical Value	0.325295
Gamma Statistics		Data follow gamma distribution at 5% significance level	
k hat	0.606144	95% UCLs (Assuming Gamma Distribution)	
k star (bias corrected)	0.441606	Approximate Gamma UCL	11592.35
Theta hat	5361.764	Adjusted Gamma UCL	17996.77
Theta star	7359.502	Lognormal Distribution Test	
nu hat	8.486013	Shapiro-Wilk Test Statistic	0.92716
nu star	6.182484	Shapiro-Wilk 5% Critical Value	0.803
Approx. Chi Square Value (.05)	1.733304	Data are lognormal at 5% significance level	
Adjusted Level of Significance	0.01584	95% UCLs (Assuming Lognormal Distribution)	
Adjusted Chi Square Value	1.116482	95% H-UCL	313277.7
Log-transformed Statistics		95% Chebyshev (MVUE) UCL	13239.09
Minimum of log data	4.941642	97.5% Chebyshev (MVUE) UCL	17420.71
Maximum of log data	9.472705	99% Chebyshev (MVUE) UCL	25634.68
Mean of log data	7.068583	95% Non-parametric UCLs	
Standard Deviation of log data	1.718111	CLT UCL	6085.878
Variance of log data	2.951906	Adj-CLT UCL (Adjusted for skewness)	7526.801
RECOMMENDATION		Mod-t UCL (Adjusted for skewness)	6824.974
Data follow gamma distribution (0.05)		Jackknife UCL	6600.219
Use Approximate Gamma UCL		Standard Bootstrap UCL	5887.585
		Bootstrap-t UCL	10710.39
		Hall's Bootstrap UCL	16154.02
		Percentile Bootstrap UCL	6372.857
		BCA Bootstrap UCL	6172.857
		95% Chebyshev (Mean, Sd) UCL	10765.14
		97.5% Chebyshev (Mean, Sd) UCL	14016.95
		99% Chebyshev (Mean, Sd) UCL	20404.49

11592.35

<b>Raw Statistics</b>		<b>Normal Distribution Test</b>	
Number of Valid Samples	7	Shapiro-Wilk Test Statistic	0.679277
Number of Unique Samples	7	Shapiro-Wilk 5% Critical Value	0.803
Minimum	5.5	Data not normal at 5% significance level	
Maximum	950	95% UCL (Assuming Normal Distribution)	
Mean	248.7571	Student's-t UCL	541.0091
Median	14	<b>Gamma Distribution Test</b>	
Standard Deviation	397.918	A-D Test Statistic	0.793013
Variance	158338.7	A-D 5% Critical Value	0.772061
Coefficient of Variation	1.599624	K-S Test Statistic	0.307451
Skewness	1.368129	K-S 5% Critical Value	0.332187
<b>Gamma Statistics</b>		Data follow approximate gamma distribution at 5% significance level	
k hat	0.373951	95% UCLs (Assuming Gamma Distribution)	
k star (bias corrected)	0.308925	Approximate Gamma UCL	1260.097
Theta hat	665.2124	Adjusted Gamma UCL	2214.85
Theta star	805.2357	<b>Lognormal Distribution Test</b>	
nu hat	5.23532	Shapiro-Wilk Test Statistic	0.830089
nu star	4.324945	Shapiro-Wilk 5% Critical Value	0.803
Approx. Chi Square Value (.05)	0.853792	Data are lognormal at 5% significance level	
Adjusted Level of Significance	0.01584	95% UCLs (Assuming Lognormal Distribution)	
Adjusted Chi Square Value	0.485749	95% H-UCL	285000.5
<b>Log-transformed Statistics</b>		95% Chebyshev (MVUE) UCL	948.0442
Minimum of log data	1.704748	97.5% Chebyshev (MVUE) UCL	1260.86
Maximum of log data	6.856462	99% Chebyshev (MVUE) UCL	1875.326
Mean of log data	3.737528	<b>95% Non-parametric UCLs</b>	
Standard Deviation of log data	2.171755	CLT UCL	496.1412
Variance of log data	4.716521	Adj-CLT UCL (Adjusted for skewness)	579.2416
<b>RECOMMENDATION</b>		Mod-t UCL (Adjusted for skewness)	553.9711
Assuming gamma distribution (0.05)		Jackknife UCL	541.0091
Use Adjusted Gamma UCL		Standard Bootstrap UCL	477.3121
Recommender 2214.85		Bootstrap-t UCL	4491.506
		Hall's Bootstrap UCL	6846.636
		Percentile Bootstrap UCL	481.1429
		BCA Bootstrap UCL	472.6429
		95% Chebyshev (Mean, Sd) UCL	904.3306
		97.5% Chebyshev (Mean, Sd) UCL	1187.998
		99% Chebyshev (Mean, Sd) UCL	1745.207

Raw Statistics		Normal Distribution Test	
Number of Valid Samples	7	Shapiro-Wilk Test Statistic	0.704989
Number of Unique Samples	7	Shapiro-Wilk 5% Critical Value	0.803
Minimum	36	Data not normal at 5% significance level	
Maximum	7800	95% UCL (Assuming Normal Distribution)	
Mean	2538.143	Student's-t UCL	5126.009
Median	660	Gamma Distribution Test	
Standard Deviation	3523.529	A-D Test Statistic	0.384591
Variance	12415255	A-D 5% Critical Value	0.758247
Coefficient of Variation	1.388231	K-S Test Statistic	0.196922
Skewness	1.161826	K-S 5% Critical Value	0.328857
Gamma Statistics		Data follow gamma distribution at 5% significance level	
k hat	0.458803	95% UCLs (Assuming Gamma Distribution)	
k star (bias corrected)	0.357411	Approximate Gamma UCL	11010
Theta hat	5532.1	Adjusted Gamma UCL	18354.91
Theta star	7101.466	Lognormal Distribution Test	
nu hat	6.423239	Shapiro-Wilk Test Statistic	0.925457
nu star	5.003756	Shapiro-Wilk 5% Critical Value	0.803
Approx. Chi Square Value (.05)	1.15352	Data are lognormal at 5% significance level	
Adjusted Level of Significance	0.01584	95% UCLs (Assuming Lognormal Distribution)	
Adjusted Chi Square Value	0.691926	95% H-UCL	3074641
Log-transformed Statistics		95% Chebyshev (MVUE) UCL	13223.13
Minimum of log data	3.583519	97.5% Chebyshev (MVUE) UCL	17573.17
Maximum of log data	8.961879	99% Chebyshev (MVUE) UCL	26117.99
Mean of log data	6.435996	95% Non-parametric UCLs	
Standard Deviation of log data	2.131196	CLT UCL	4728.707
Variance of log data	4.541998	Adj-CLT UCL (Adjusted for skewness)	5353.594
RECOMMENDATION		Mod-t UCL (Adjusted for skewness)	5223.478
Data follow gamma distribution (0.05)		Jackknife UCL	5126.009
Use Adjusted Gamma UCL		Standard Bootstrap UCL	4582.155
Recommender 18354.91		Bootstrap-t UCL	16948.2
		Hall's Bootstrap UCL	21842.29
		Percentile Bootstrap UCL	4631.571
		BCA Bootstrap UCL	4538.857
		95% Chebyshev (Mean, Sd) UCL	8343.188
		97.5% Chebyshev (Mean, Sd) UCL	10855.04
		99% Chebyshev (Mean, Sd) UCL	15789.07

Raw Statistics		Normal Distribution Test	
Number of Valid Samples	7	Shapiro-Wilk Test Statistic	0.705154
Number of Unique Samples	7	Shapiro-Wilk 5% Critical Value	0.803
Minimum	98	Data not normal at 5% significance level	
Maximum	94000	95% UCL (Assuming Normal Distribution)	
Mean	22772.57	Student's-t UCL	49961.39
Median	620	Gamma Distribution Test	
Standard Deviation	37019.14	A-D Test Statistic	0.583738
Variance	1.37E+09	A-D 5% Critical Value	0.783794
Coefficient of Variation	1.625602	K-S Test Statistic	0.310322
Skewness	1.585117	K-S 5% Critical Value	0.335016
Gamma Statistics		Data follow gamma distribution at 5% significance level	
k hat	0.301878	95% UCLs (Assuming Gamma Distribution)	
k star (bias corrected)	0.26774	Approximate Gamma UCL	136660.6
Theta hat	75436.34	Adjusted Gamma UCL	252608
Theta star	85054.86	Lognormal Distribution Test	
nu hat	4.226292	Shapiro-Wilk Test Statistic	0.882546
nu star	3.748357	Shapiro-Wilk 5% Critical Value	0.803
Approx.Chi Square Value (.05)	0.624611	Data are lognormal at 5% significance level	
Adjusted Level of Significance	0.01584	95% UCLs (Assuming Lognormal Distribution)	
Adjusted Chi Square Value	0.337914	95% H-UCL	2.42E+09
Log-transformed Statistics		95% Chebyshev (MVUE) UCL	127859.6
Minimum of log data	4.584967	97.5% Chebyshev (MVUE) UCL	171320.6
Maximum of log data	11.45105	99% Chebyshev (MVUE) UCL	256691.4
Mean of log data	7.751385	95% Non-parametric UCLs	
Standard Deviation of log data	2.731399	CLT UCL	45787.23
Variance of log data	7.460543	Adj-CLT UCL (Adjusted for skewness)	54744.39
RECOMMENDATION		Mod-t UCL (Adjusted for skewness)	51358.52
Data follow gamma distribution (0.05)		Jackknife UCL	49961.39
Use Adjusted Gamma UCL		Standard Bootstrap UCL	44006.99
		Bootstrap-t UCL	234968.7
		Hall's Bootstrap UCL	329663.7
		Percentile Bootstrap UCL	48114
		BCA Bootstrap UCL	42438.29
		95% Chebyshev (Mean, Sd) UCL	83761.94
		97.5% Chebyshev (Mean, Sd) UCL	110152.1
		99% Chebyshev (Mean, Sd) UCL	161990.4
Recommender	252608		

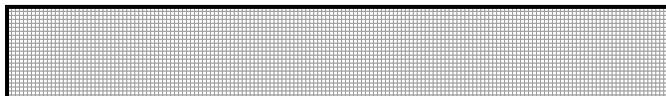
**Appendix A-2**  
**USEPA Adult Lead Model**

**Table A2-1  
Calculation of Lead  
Exposure Using USEPA Adult Lead Model  
Omega Chemical Site - Whittier, California**

**Calculations of Blood Lead Concentrations (PbBs)**

U.S. EPA Technical Review Workgroup for Lead, Adult Lead Committee

Version date 05/19/03



Exposure Variable	PbB Equation <sup>1</sup>		Description of Exposure Variable	Units	Values for Non-Residential Exposure Scenario			
	1*	2**			Using Equation 1		Using Equation 2	
					GSDi = Hom	GSDi = Het	GSDi = Hom	GSDi = Het
PbS	X	X	Soil lead concentration	ug/g or ppm	44.4	44.4	44.4	44.4
R <sub>fetal/maternal</sub>	X	X	Fetal/maternal PbB ratio	--	0.9	0.9	0.9	0.9
BKSF	X	X	Biokinetic Slope Factor	ug/dL per ug/day	0.4	0.4	0.4	0.4
GSD <sub>i</sub>	X	X	Geometric standard deviation PbB	--	2.1	2.3	2.1	2.3
PbB <sub>0</sub>	X	X	Baseline PbB	ug/dL	1.5	1.7	1.5	1.7
IR <sub>S</sub>	X		Soil ingestion rate (including soil-derived indoor dust)	g/day	0.100	0.100	--	--
IR <sub>S+D</sub>		X	Total ingestion rate of outdoor soil and indoor dust	g/day	--	--	0.100	0.100
W <sub>S</sub>		X	Weighting factor; fraction of IR <sub>S+D</sub> ingested as outdoor soil	--	--	--	1.0	1.0
K <sub>SD</sub>		X	Mass fraction of soil in dust	--	--	--	0.7	0.7
AF <sub>S,D</sub>	X	X	Absorption fraction (same for soil and dust)	--	0.12	0.12	0.12	0.12
EF <sub>S,D</sub>	X	X	Exposure frequency (same for soil and dust)	days/yr	250	250	250	250
AT <sub>S,D</sub>	X	X	Averaging time (same for soil and dust)	days/yr	365	365	365	365
<b>PbB<sub>adult</sub></b>	<b>PbB of adult worker, geometric mean</b>			<b>ug/dL</b>	<b>1.6</b>	<b>1.8</b>	<b>1.6</b>	<b>1.8</b>
<b>PbB<sub>fetal, 0.95</sub></b>	<b>95th percentile PbB among fetuses of adult workers</b>			<b>ug/dL</b>	<b>5.0</b>	<b>6.5</b>	<b>5.0</b>	<b>6.5</b>
<b>PbB<sub>t</sub></b>	<b>Target PbB level of concern (e.g., 10 ug/dL)</b>			<b>ug/dL</b>	<b>10.0</b>	<b>10.0</b>	<b>10.0</b>	<b>10.0</b>
<b>P(PbB<sub>fetal</sub> &gt; PbB<sub>t</sub>)</b>	<b>Probability that fetal PbB &gt; PbB<sub>t</sub>, assuming lognormal distribution</b>			<b>%</b>	<b>0.5%</b>	<b>1.6%</b>	<b>0.5%</b>	<b>1.6%</b>

<sup>1</sup> Equation 1 does not apportion exposure between soil and dust ingestion (excludes W<sub>S</sub>, K<sub>SD</sub>).  
When IR<sub>S</sub> = IR<sub>S+D</sub> and W<sub>S</sub> = 1.0, the equations yield the same PbB<sub>fetal,0.95</sub>.

**\*Equation 1, based on Eq. 1, 2 in USEPA (1996).**

<b>PbB<sub>adult</sub></b> =	$(PbS * BKSF * IR_{S+D} * AF_{S,D} * EF_S / AT_{S,D}) + PbB_0$
<b>PbB<sub>fetal, 0.95</sub></b> =	$PbB_{adult} * (GSD_i^{1.645} * R)$

**\*\*Equation 2, alternate approach based on Eq. 1, 2, and A-19 in USEPA (1996).**

<b>PbB<sub>adult</sub></b> =	$PbS * BKSF * [(IR_{S+D}) * AF_S * EF_S * W_S] + [K_{SD} * (IR_{S+D}) * (1 - W_S) * AF_D * EF_D] / 365 + PbB_0$
<b>PbB<sub>fetal, 0.95</sub></b> =	$PbB_{adult} * (GSD_i^{1.645} * R)$

**Appendix A-3**  
**RAGS D Tables**

TABLE A3-1.0  
SELECTION OF EXPOSURE PATHWAYS  
Omega Chemical Site - Whittier, California

Scenario Timeframe	Medium	Exposure Medium	Exposure Point	Receptor Population	Receptor Age	Exposure Route	Onsite/ Offsite	Type of Analysis	Rationale for Selection or Exclusion of Exposure Pathway
Current/Future	Soil	Surface Soil	Soil at Omega Site from 0' to 3'	Current Industrial Worker	Adult	Ingestion	Onsite	Quantitative	Current/future industrial workers may incidentally ingest surface soil
						Dermal	Onsite	Quantitative	Current/future industrial workers may come into contact with surface soil
						Inhalation	Onsite	None	Current/future industrial workers are not expected to inhale soil particulates
				Construction Worker	Adult	Ingestion	Onsite	Quantitative	Current/future construction workers may incidentally ingest surface soil
						Dermal	Onsite	Quantitative	Current/future construction workers may come into contact with surface soil
						Inhalation	Onsite	Quantitative	Current/future construction workers may inhale surface soil particulates
		Subsurface Soil	Soil at Omega Site from 0' to 30'	Current Industrial Worker	Adult	Ingestion	Onsite	None	Current/future industrial workers are not expected to incidentally ingest subsurface soil
						Dermal	Onsite	None	Current/future industrial workers are not expected to come into contact with subsurface soil
						Inhalation	Onsite	None	Current/future industrial workers are not expected to inhale subsurface soil particulates
				Construction Worker	Adult	Ingestion	Onsite	Quantitative	Current/future construction workers may incidentally ingest subsurface soil
						Dermal	Onsite	Quantitative	Current/future construction workers may come into contact with subsurface soil
						Inhalation	Onsite	Quantitative	Current/future construction workers may inhale subsurface soil particulates
	Soil Gas <sup>(1)</sup>	Ambient Air	Current Industrial Worker	Adult	Inhalation	Onsite	None	Current/future industrial workers are not expected to be exposed to soil gas in ambient air	
					Construction Worker	Adult	Inhalation	Onsite	Qualitative - See Text
		Indoor Air <sup>(1)</sup>	Current Industrial Worker	Adult			Inhalation	Onsite	Quantitative
					Groundwater	Groundwater	Groundwater in Drinking Water	Current Industrial Worker	Adult
	Dermal	Onsite	None	Current/future industrial workers are not expected to come into contact with groundwater from the site					
	Inhalation	Onsite	None	Current/future industrial workers are not expected to inhale contaminants of groundwater origin					
Construction Worker	Adult	Ingestion	Onsite	None				Current/future construction workers are not expected to incidentally ingest groundwater	
		Dermal	Onsite	None				Current/future construction workers are not expected to come into contact with groundwater	
		Inhalation	Onsite	None				Current/future construction workers are not expected to inhale contaminants of groundwater origin	
Indoor Air <sup>(1)</sup> from Soil Gas of Groundwater Origin	Current Industrial Worker	Adult	Inhalation	Onsite			Qualitative - See Text	Current/future industrial workers may be exposed to groundwater migrating through soil gas into indoor air	

(1) Note that indoor air was evaluated using 3 different sets of data - indoor air, soil gas, and groundwater - to see which set of data yields the most conservative results. Since these pathways all address the same pathway - inhalation of indoor air, only the most conservative results of these three pathways will be included in the total risks and hazards to prevent overrepresentation of this pathway in the total.

TABLE A3-2.1A - Parcel A  
 OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN - Surface Soil  
 Omega Chemical Site - Whittier, California

Scenario Timeframe:	Current/Future
Medium:	Surface Soil 0' to 3'
Exposure Medium:	Surface Soil 0' to 3'

Exposure Point	CAS Number	Chemical	Minimum Concentration	Maximum Concentration	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits (1)	Concentration Used for Screening (2)	Background Value (3)	Screening Toxicity Value (nc/ca) (4)	Potential ARAR/TBC Value	Potential ARAR/TBC Source (5)	COPC Flag (Y/N)	Rationale for Selection or Deletion (5)
Surface Soil	95-50-1	1,2-DICHLOROBENZENE	0.083	0.24	mg/kg	OC-SS-000-20-040604	2 / 20	0.09 - 8	0.24	NA	6.0E+01 sat			No	BSL
	123-91-1	1,4-DIOXANE	0.014	14	mg/kg	OC-SS-000-20-040604	10 / 19	0.03 - 0.2	14	NA	1.6E+01 ca			No	BSL
	91-57-6	2-METHYLNAPHTHALENE	0.48	0.48	mg/kg	OC-SS-000-20-040604	1 / 22	0.09 - 8	0.48	NA				Yes	NSL
	72-54-8	4,4'-DDD	0.0016	0.032	mg/kg	OC-SS-000-15-040504	2 / 22	0.0005 - 0.205	0.032	NA	1.0E+00 ca			No	BSL
	72-55-9	4,4'-DDE	0.001	0.3	mg/kg	OC-SS-000-15-040504	6 / 22	0.0005 - 0.205	0.3	NA	7.0E-01 ca			No	BSL
	50-29-3	4,4'-DDT	0.003	0.15	mg/kg	OC-SS-000-16-040504	6 / 22	0.0005 - 0.205	0.15	NA	7.0E-01 ca*			No	BSL
	7429-90-5	ALUMINUM	9585	9830	mg/kg	OC1-000-12-S-0-7	2 / 2	NR - NR	9830	NA	1.0E+04 max			No	BSL
	7440-36-0	ANTIMONY	0.6	0.9	mg/kg	OC-SS-000-17-040604, OC-SS-000-19-040604	8 / 22	6.7 - 10	0.9	NA	4.1E+01 nc			No	BSL
	7440-38-2	ARSENIC	3	21	mg/kg	OCSS-000-01-040504	22 / 22	1 - 1	21	NA	2.5E-02 ca			No	STAT
	7440-39-3	BARIUM	75	210	mg/kg	OC-SS-000-18-040604	22 / 22	1 - 1	210	NA	6.7E+03 nc			No	BSL
	56-55-3	BENZO(A)ANTHRACENE	0.032	0.032	mg/kg	OC-SS-000-09-040504	1 / 20	0.09 - 8	0.032	NA	2.1E-01 ca			No	BSL
	7440-41-7	BERYLLIUM	0.18	0.52	mg/kg	OC-SS-000-20-040604	22 / 22	1 - 1	0.52	NA	1.9E+02 ca**			No	BSL
	117-81-7	BIS(2-ETHYLHEXYL)PHTHALATE	0.03	51	mg/kg	OC-SS-000-20-040604	8 / 20	0.2 - 20	51	NA	1.2E+01 ca			Yes	ASL
	85-68-7	BUTYLBENZYL PHTHALATE	0.85	1.9	mg/kg	OCSS-000-01-040504	2 / 20	0.09 - 8	1.9	NA	1.0E+04 max			No	BSL
	7440-43-9	CADIUM	0.25	2.1	mg/kg	OC1-000-04-S-0-5, OCSS-000-07-040504	22 / 22	1 - 1	2.1	NA	4.5E+01 nc			No	BSL
	7440-23-5	CALCIUM	6055	7170	mg/kg	OC1-000-12-S-0-7	2 / 2	NR - NR	7170	NA				No	NUT
	7440-47-3	CHROMIUM	7.11	308.6	mg/kg	OC-SS-000-09-040504	22 / 22	1 - 1	309	NA	4.5E+01 ca			Yes	ASL
	18540-29-9	CHROMIUM VI	1.19	51.4	mg/kg	OC-SS-000-09-040504	22 / 22	1 - 1	51.4	NA	6.4E+00 ca			Yes	ASL
	218-01-9	CHRYSENE	0.038	0.038	mg/kg	OC-SS-000-09-040504	1 / 20	0.09 - 8	0.04	NA	2.1E+01 ca			No	BSL
	7440-48-4	COBALT	6.3	12	mg/kg	OCSS-000-03-040504	22 / 22	5 - 5	12.0	NA	1.9E+02 ca*			No	BSL
	7440-50-8	COPPER	13	35	mg/kg	OCSS-000-06-040504	22 / 22	2 - 2	35	NA	4.1E+03 nc			No	BSL
	60-57-1	DIELDRIN	0.0084	0.05	mg/kg	OC-SS-000-15-040504	2 / 22	0.0005 - 0.205	0.05	NA	1.1E-02 ca			Yes	ASL
	84-66-2	DIETHYL PHTHALATE	0.037	0.037	mg/kg	OC-SS-000-14-040504	1 / 20	0.09 - 8	0.037	NA	1.0E+04 max			No	BSL
	84-74-2	DI-N-BUTYLPHTHALATE	0.33	0.33	mg/kg	OC-SS-000-20-040604	1 / 20	0.09 - 8	0.33	NA	6.2E+03 nc			No	BSL
	72-20-8	ENDRIN	0.032	0.032	mg/kg	OC-SS-000-15-040504	1 / 22	0.0005 - 0.305	0.032	NA	1.8E+01 nc			No	BSL
	206-44-0	FLUORANTHENE (IDRYL)	0.033	0.033	mg/kg	OC-SS-000-09-040504	1 / 20	0.09 - 8	0.033	NA	2.2E+03 nc			No	BSL
	7439-89-6	IRON	22100.00	23200	mg/kg	OC1-000-04-S-0-5	2 / 2	NR - NR	23200	NA	1.0E+04 max			Yes	ASL
	7439-92-1	LEAD	5.00	100.0	mg/kg	OCSS-000-06-040504	22 / 22	5 - 5	100.0	NA	8.0E+01 nc			Yes	ASL
	7439-95-4	MAGNESIUM	5190	5575	mg/kg	OC1-000-04-S-0-5	2 / 2	NR - NR	5575	NA				No	NUT
	7439-96-5	MANGANESE	239	353	mg/kg	OC1-000-12-S-0-7	2 / 2	NR - NR	353	NA	1.9E+03 nc			No	BSL
	7487-94-7	MERCURY	0.029	0.85	mg/kg	OCSS-000-01-040504	20 / 22	0.11 - 0.2	0.85	NA	3.1E+01 nc			No	BSL
	7439-98-7	MOLYBDENUM	3	3	mg/kg	OCSS-000-08-040504	1 / 20	5 - 5	3	NA	5.1E+02 nc			No	BSL
	91-20-3	NAPHTHALENE	1.2	1.2	mg/kg	OC-SS-000-20-040604	1 / 22	0.09 - 8	1.2	NA	4.2E-01 ca			Yes	ASL
	7440-02-0	NICKEL	9.2	29.5	mg/kg	OC1-000-04-S-0-5	22 / 22	1 - 1	29.5	NA	2.0E+03 nc			No	BSL
	11097-69-1	PCB-1254 (AROCLOL 1254)	0.5	0.5	mg/kg	OC-SS-000-16-040504	1 / 22	0.01 - 0.05	0.5	NA	7.4E-02 ca*			Yes	ASL

TABLE A3-2.1A - Parcel A  
 OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN - Surface Soil  
 Omega Chemical Site - Whittier, California

Scenario Timeframe:	Current/Future
Medium:	Surface Soil 0' to 3'
Exposure Medium:	Surface Soil 0' to 3'

Exposure Point	CAS Number	Chemical	Minimum Concentration	Maximum Concentration	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits (1)	Concentration Used for Screening (2)	Background Value (3)	Screening Toxicity Value (nc/ca) (4)	Potential ARAR/TBC Value	Potential ARAR/TBC Source (5)	COPC Flag (Y/N)	Rationale for Selection or Deletion (5)
	85-01-8	PHENANTHRENE	0.013	0.03	mg/kg	OC-SS-000-09-040504	2 / 20	0.09 - 8	0.03	NA				Yes	NSL
	12674-11-2	POLYCHLORINATED BI PHENYLS, TOTAL	0.5	0.5	mg/kg	OC-SS-000-16-040504	1 / 20	0.01 - 0.02	0.5	NA	2.1E+00	ca**		No	BSL
	7440-09-7	POTASSIUM	4350	4520	mg/kg	OC1-000-12-S-0-7	2 / 2	NR - NR	4520	NA				No	NUT
	129-00-0	PYRENE	0.018	0.044	mg/kg	OC-SS-000-09-040504	2 / 20	0.09 - 8	0.044	NA	2.9E+03	nc		No	BSL
	7440-22-4	SILVER	0.56	1.2	mg/kg	OCSS-000-06-040504	3 / 22	1 - 1	1.2	NA	5.1E+02	nc		No	BSL
	7440-23-5	SODIUM	290	320	mg/kg	OC1-000-04-S-0-5	2 / 2	NR - NR	320	NA				No	NUT
	7440-28-0	THALLIUM	0.9	2	mg/kg	OCSS-000-02-040504 <sup>2</sup>	14 / 22	2.8 - 10	2	NA	6.7E+00	nc		No	BSL
	7440-62-2	VANADIUM	20	52.5	mg/kg	OCSS-000-08-040504	22 / 22	1 - 1	52.5	NA	1.0E+02	nc		No	BSL
	7440-66-6	ZINC	34	160	mg/kg	OCSS-000-07-040504	22 / 22	5 - 5	160	NA	1.0E+04	max		No	BSL

- (1) Detection limits for detected chemicals in historical data were not available.
- (2) Maximum detected concentration used for screening.
- (3) Maximum detected background concentration.
- (4) Screened against 1/10th EPA's Region 9 Preliminary Remediation Goals (PRGs) for industrial soil (EPA 2004c) to account for additivity of multiple chemicals.
- (5) Not available.
- (6) Chromium concentrations were divided between Chromium III and Chromium VI assuming a 1:6 ratio of Cr VI:Cr III
- (7) Rationale Codes:

Selection Reason: ASL: Above Screening Level  
 TOX: Chemical is a Class A Carcinogen  
 DET: Relatively few chemicals detected at site, so comparison with screening levels and frequency of detection were not used to eliminate COPCs

Deletion Reason: NSL: No Screening Level  
 BSL: Below Screening Level  
 NUT: Essential Nutrient  
 NTX: No Toxicity Information Available  
 IFD: Infrequent Detection  
 STAT: Not a site contaminant according to separate statistical analysis, see text

Definitions: NA: Not Available.  
 ND: Not Detected.  
 nc: Screening Toxicity Value is based on noncancer effects.  
 ca: Screening Toxicity Value is based on cancer effects.  
 COPC: Chemical of Potential Concern.  
 ARAR/TBC: Applicable or Relevant and Appropriate Requirement/To Be Considered.  
 VOCs: Volatile Organic Compounds.  
 ug/kg: microgram per kilogram.  
 ca\*: where nc PRG < 100X ca PRG  
 ca\*\*: where nc PRG < 10X ca PRG

TABLE A3-2.2A - Parcel Site  
 OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN - Surface and Subsurface Soil  
 Omega Chemical Site - Whittier, California

Scenario Timeframe:	Future
Medium:	Surface & Subsurface Soil to 30'
Exposure Medium:	Surface & Subsurface Soil to 30'

Exposure Point	CAS Number	Chemical	Minimum Concentration	Maximum Concentration	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits (1)	Concentration Used for Screening (2)	Background Value (3)	Screening Toxicity Value (nc/ca) (4)	Potential ARAR/TBC Value	Potential ARAR/TBC Source (5)	COPC Flag (Y/N)	Rationale for Selection or Deletion (5)
Subsurface Soil	71-55-6	1,1,1-TRICHLOROETHANE	0.00097	1200	mg/kg	SB-9-5.9-SOIL-12/13/1995	20 / 64	0.00083 - 30	1200	NA	1.2E+02 sat			Yes	ASL
	76-13-1	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	0.0072	590	mg/kg	SB-9-5.9-SOIL-12/13/1995	10 / 64	0.005 - 100	590	NA	5.6E+02 sat			Yes	ASL
	79-00-5	1,1,2-TRICHLOROETHANE	0.0034	0.011	mg/kg	MIP3-B2-30	6 / 64	0.0008 - 50	0.011	NA	1.6E-01 ca*			No	BSL
	75-34-3	1,1-DICHLOROETHANE	0.0036	0.013	mg/kg	MIP3-B2-30	6 / 64	0.0008 - 50	0.013	NA	6.0E-01 ca			No	BSL
	75-35-4	1,1-DICHLOROETHENE	0.0019	60	mg/kg	SB-9-1.8-SOIL-12/13/1995	16 / 64	0.0008 - 50	60	NA	4.1E+01 nc			Yes	ASL
	95-50-1	1,2-DICHLOROBENZENE	0.00088	0.24	mg/kg	OC-SS-000-20-040604	3 / 84	0.00083 - 50	0.24	NA	6.0E+01 sat			No	BSL1
	107-06-2	1,2-DICHLOROETHANE	0.0032	1.6	mg/kg	SUMP-0.5-SOIL-9/12/96	8 / 64	0.0008 - 50	1.6	NA	6.0E-02 ca*			Yes	ASL
	106-46-7	1,4-DICHLOROBENZENE	0.0016	0.0016	mg/kg	MIP3-B2-05	1 / 84	0.0008 - 50	0.0016	NA	7.9E-01 ca			No	BSL1
	123-91-1	1,4-DIOXANE	0.014	41	mg/kg	MIP3-B2-15	18 / 35	0.025 - 2.5	41	NA	1.6E+01 ca			Yes	ASL
	91-57-6	2-METHYLNAPHTHALENE	0.48	0.54	mg/kg	SB-15-1.7-SOIL-12/11/1995	2 / 40	0.09 - 8	0.54	NA	1.6E+01 ca			Yes	NSL
	72-54-8	4,4'-DDD	0.0015	0.032	mg/kg	OC-SS-000-15-040504	3 / 40	0.0005 - 0.205	0.032	NA	1.0E+00 ca			No	BSL
	72-55-9	4,4'-DDE	0.001	0.3	mg/kg	OC-SS-000-15-040504	6 / 22	0.0005 - 0.205	0.3	NA	7.0E-01 ca			No	BSL
	50-29-3	4,4'-DDT	0.003	0.15	mg/kg	OC-SS-000-16-040504	6 / 22	0.0005 - 0.205	0.15	NA	7.0E-01 ca*			No	BSL
	67-64-1	ACETONE	34	34	mg/kg	SUMP-5-SOIL-9/12/96	1 / 64	0.0081 - 1000	34	NA	5.4E+03 nc			No	BSL1
	7429-90-5	ALUMINIUM	9585	9830	mg/kg	OC1-000-12-S-0-7	2 / 2	0 - 0	9830	NA	1.0E+04 max			No	BSL
	7440-36-0	ANTIMONY	0.6	18	mg/kg	SB-13-1.8-SOIL-12/12/1995	10 / 40	6.7 - 10	18	NA	4.1E+01 nc			No	BSL
	7440-38-2	ARSENIC	0.81	21	mg/kg	OCSS-000-01-040504	40 / 40	1 - 1	21	NA	2.5E-02 ca			No	STAT
	7440-39-3	BARIUM	28	230	mg/kg	SB-13-1.8-SOIL-12/12/1995	40 / 40	1 - 1	230	NA	6.7E+03 nc			No	BSL
	71-43-2	BENZENE	0.0019	0.0019	mg/kg	MIP3-B2-30	1 / 64	0.00083 - 50	0.0019	NA	1.4E-01 ca*			No	BSL1
	56-55-3	BENZO(A)ANTHRACENE	0.032	2.4	mg/kg	SB-15-1.7-SOIL-12/11/1995	2 / 38	0.09 - 8	2.4	NA	2.1E-01 ca			Yes	ASL
	50-32-8	BENZO(A)PYRENE	1.6	1.6	mg/kg	SB-15-1.7-SOIL-12/11/1995	1 / 38	0.09 - 8	1.6	NA	2.1E-02 ca			Yes	ASL
	205-99-2	BENZO(B)FLUORANTHENE	0.91	0.91	mg/kg	SB-15-1.7-SOIL-12/11/1995	1 / 38	0.09 - 8	0.91	NA	2.1E-01 ca			Yes	ASL
	191-24-2	BENZO(G,H,I)PERYLENE	0.49	0.49	mg/kg	SB-15-1.7-SOIL-12/11/1995	1 / 38	0.09 - 8	0.49	NA				No	NTX1
	100-51-6	BENZYL ALCOHOL (PHENYLMETHANOL)	5.2	22	mg/kg	SB-9-5.9-SOIL-12/13/1995	2 / 38	0.09 - 8	22	NA	1.0E+04 max			No	BSL
	7440-41-7	BERYLLIUM	0.18	0.75	mg/kg	SB-12-1.7-SOIL-12/11/1995	40 / 40	1 - 1	0.75	NA	1.9E+02 ca**			No	BSL
	117-81-7	BIS(2-ETHYLHEXYL)PHTHALATE	0.03	51	mg/kg	OC-SS-000-20-040604	13 / 38	0.2 - 20	51	NA	1.2E+01 ca			Yes	ASL
	75-25-2	BROMOFORM	0.013	0.013	mg/kg	MIP3-B2-15	1 / 64	0.004 - 50	0.013	NA	2.2E+01 ca*			No	BSL1
	85-68-7	BUTYLBENZYL PHTHALATE	0.85	1.9	mg/kg	OCSS-000-01-040504	2 / 38	0.09 - 8	1.9	NA	1.0E+04 max			No	BSL
	7440-43-9	CADMIUM	0.25	2.1	mg/kg	OC1-000-04-S-0-5, OCSS-000-07-040504	22 / 40	0.5 - 1	2.1	NA	4.5E+01 nc			No	BSL
	7440-23-5	CALCIUM	6055	7170	mg/kg	OC1-000-12-S-0-7	2 / 2	0 - 0	7170	NA				No	NUT
	67-66-3	CHLOROFORM	0.0014	0.013	mg/kg	MIP3-B2-30	10 / 64	0.0008 - 50	0.013	NA	2.0E-01 ca			No	BSL
	7440-47-3	CHROMIUM	5.6	360	mg/kg	OC-SS-000-09-040504	40 / 40	1 - 1	360	NA	4.5E+01 ca			Yes	ASL
	16065-83-1	CHROMIUM III	4.8	309	mg/kg		0 / 0	0 - 0	309	NA	1.0E+04 max			No	BSL
	18540-29-9	CHROMIUM VI	0.8	51.4	mg/kg	OC-SS-000-09-040504	40 / 40	-	51.4	NA	6.4E+00 ca			Yes	ASL
	218-01-9	CHRYSENE	0.038	6	mg/kg	SB-15-1.7-SOIL-12/11/1995	2 / 38	0.09 - 8	6	NA	2.1E+01 ca			No	BSL
	156-59-2	CIS-1,2-DICHLOROETHENE	0.00096	0.0018	mg/kg	OC-SB-GP6-MIP-25-012204	2 / 64	0.00083 - 50	0.0018	NA	1.5E+01 nc			No	BSL1
	7440-48-4	COBALT	4.7	16	mg/kg	SB-12-1.7-SOIL-12/11/1995	39 / 40	4 - 5	16	NA	1.9E+02 ca*			No	BSL
	7440-50-8	COPPER	13	150	mg/kg	SB-12-1.7-SOIL-12/11/1995	40 / 40	2 - 2	150	NA	4.1E+03 nc			No	BSL
	60-57-1	DIELDRIN	0.0084	0.05	mg/kg	OC-SS-000-15-040504	2 / 40	0.0005 - 0.205	0.05	NA	1.1E-02 ca			Yes	ASL
	84-66-2	DIETHYL PHTHALATE	0.037	0.037	mg/kg	OC-SS-000-14-040504	1 / 38	0.09 - 8	0.037	NA	1.0E+04 max			No	BSL1
	84-74-2	DI-N-BUTYLPHTHALATE	0.33	0.33	mg/kg	OC-SS-000-20-040604	1 / 38	0.09 - 8	0.33	NA	6.2E+03 nc			No	BSL1
	117-84-0	DI-N-OCTYL PHTHALATE (DIOCTYL PHTHALATE)	0.24	0.24	mg/kg	SB-11-1.8-SOIL-12/14/1995	1 / 38	0.09 - 8	0.24	NA	2.5E+03 nc			No	BSL1
	72-20-8	ENDRIN	0.032	0.032	mg/kg	OC-SS-000-15-040504	1 / 40	0.0005 - 0.305	0.032	NA	1.8E+01 nc			No	BSL1
	206-44-0	FLUORANTHENE (IDRYL)	0.033	0.66	mg/kg	SB-15-1.7-SOIL-12/11/1995	2 / 38	0.09 - 8	0.66	NA	2.2E+03 nc			No	BSL
	7439-89-6	IRON	22100	23200	mg/kg	OC1-000-04-S-0-5	2 / 2	0 - 0	23200	NA	1.0E+04 max			Yes	ASL
	78-59-1	ISOPHORONE	0.54	9.9	mg/kg	SB-9-1.8-SOIL-12/13/1995	3 / 40	0.09 - 8	9.9	NA	5.1E+01 ca*			No	BSL
	7439-92-1	LEAD	5	890	mg/kg	SB-12-1.7-SOIL-12/11/1995	39 / 40	5 - 5	890	NA	8.0E+01 nc			Yes	ASL
	7439-95-4	MAGNESIUM	5190	5575	mg/kg	OC1-000-04-S-0-5	2 / 2	0 - 0	5575	NA				No	NUT
	7439-96-5	MANGANESE	239	353	mg/kg	OC1-000-12-S-0-7	2 / 2	0 - 0	353	NA	1.9E+03 nc			No	BSL
	7487-94-7	MERCURY	0.029	0.85	mg/kg	OCSS-000-01-040504	21 / 40	0.1 - 0.2	0.85	NA	3.1E+01 nc			No	BSL
	75-09-2	METHYLENE CHLORIDE	59	100	mg/kg	SB-9-5.9-SOIL-12/13/1995	2 / 64	0.005 - 50	100	NA	2.1E+00 ca			Yes	ASL
	7439-98-7	MOLYBDENUM	1.5	4.2	mg/kg	SB-13-1.8-SOIL-12/12/1995	17 / 38	1 - 5	4.2	NA	5.1E+02 nc			No	BSL
	91-20-3	NAPHTHALENE	1.2	1.2	mg/kg	OC-SS-000-20-040604	1 / 56	0.004 - 8	1.2	NA	4.2E-01 ca			Yes	ASL

TABLE A3-2.2A - Parcel Site  
 OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN - Surface and Subsurface Soil  
 Omega Chemical Site - Whittier, California

Scenario Timeframe:	Future
Medium:	Surface & Subsurface Soil to 30'
Exposure Medium:	Surface & Subsurface Soil to 30'

Exposure Point	CAS Number	Chemical	Minimum Concentration	Maximum Concentration	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits (1)	Concentration Used for Screening (2)	Background Value (3)	Screening Toxicity Value (nc/ca) (4)	Potential ARAR/TBC Value	Potential ARAR/TBC Source (5)	COPC Flag (Y/N)	Rationale for Selection or Deletion (5)
	7440-02-0	NICKEL	4.9	55	mg/kg	SB-12-1.7-SOIL-12/11/1995	40 / 40	1 - 1	55	NA	2.0E+03	nc		No	BSL
	11097-69-1	PCB-1254 (AROCOR 1254)	0.052	0.5	mg/kg	OC-SS-000-16-040504	3 / 40	0.01 - 0.06	0.5	NA	7.4E-02	ca*		Yes	ASL
	85-01-8	PHENANTHRENE	0.013	5	mg/kg	SB-15-1.7-SOIL-12/11/1995	3 / 38	0.09 - 8	5	NA				Yes	NSL
	12674-11-2	POLYCHLORINATED BI PHENYLS, TOTAL	0.5	0.5	mg/kg	OC-SS-000-16-040504	1 / 20	0.01 - 0.02	0.5	NA	2.1E+00	ca**		No	BSL
	7440-09-7	POTASSIUM	4350	4520	mg/kg	OC1-000-12-S-0-7	2 / 2	0 - 0	4520	NA				No	NUT
	129-00-0	PYRENE	0.018	3.1	mg/kg	SB-15-1.7-SOIL-12/11/1995	3 / 38	0.09 - 8	3.1	NA	2.9E+03	nc		No	BSL
	7440-22-4	SILVER	0.56	1.2	mg/kg	OCSS-000-06-040504	3 / 40	1 - 1	1.2	NA	5.1E+02	nc		No	BSL
	7440-23-5	SODIUM	290	320	mg/kg	OC1-000-04-S-0-5	2 / 2	0 - 0	320	NA				No	NUT
	127-18-4	TETRACHLOROETHENE	0.0091	1300	mg/kg	SB-9-1.8-SOIL-12/13/1995	63 / 64	0.001 - 0.1	1300	NA	1.3E-01	ca		Yes	ASL
	7440-28-0	THALLIUM	0.9	2	mg/kg	OCSS-000-02-0405043	14 / 40	2.8 - 10	2	NA	6.7E+00	nc		No	BSL
	108-88-3	TOLUENE	62	62	mg/kg	SB-9-5.9-SOIL-12/13/1995	1 / 64	0.00083 - 50	62	NA	5.2E+01	sat		Yes	ASL
	1330-20-7	TOTAL XYLENES	0.1	0.1	mg/kg	C-3-30-SOIL-2/1/96	1 / 51	0.0032 - 200	0.1	NA	4.2E+01	sat		No	BSL1
	156-60-5	TRANS-1,2-DICHLOROETHENE	0.0048	0.0103	mg/kg	MIP1-B3-29	2 / 64	0.0008 - 50	0.0103	NA	2.3E+01	nc		No	BSL1
	10061-02-6	TRANS-1,3-DICHLOROPROPENE	0.024	0.024	mg/kg	C-3-15-SOIL-2/1/96	1 / 64	0.0016 - 50	0.024	NA				No	IFD
	79-01-6	TRICHLOROETHENE	0.0032	140	mg/kg	SB-9-5.9-SOIL-12/13/1995	21 / 64	0.001 - 50	140	NA	6.5E-01	ca		Yes	ASL
	75-69-4	TRICHLOROFLUOROMETHANE (FREON 11)	0.017	220	mg/kg	SB-9-5.9-SOIL-12/13/1995	6 / 64	0.004 - 50	220	NA	2.0E+02	sat		Yes	ASL
	7440-62-2	VANADIUM	20	71	mg/kg	SB-5-1.8-SOIL-12/11/1995	40 / 40	1 - 1	71	NA	1.0E+02	nc		No	BSL
	108-05-4	VINYL ACETATE	0.05	0.05	mg/kg	C-3-15-SOIL-2/1/96	1 / 59	0.0083 - 500	0.05	NA	1.4E+02	nc		No	BSL1
	7440-66-6	ZINC	34	350	mg/kg	SB-12-1.7-SOIL-12/11/1995	40 / 40	5 - 5	350	NA	1.0E+04	max		No	BSL

- Detection limits for detected chemicals in historical data were not available.
- Maximum detected concentration used for screening.
- Maximum detected background concentration.
- Screened against 1/10th EPA's Region 9 Preliminary Remediation Goals (PRGs) for industrial soil (EPA 2004c) to account for additivity of multiple chemicals.
- Not available.
- Chromium concentrations were divided between Chromium III and Chromium VI assuming a 1:6 ratio of Cr VI:Cr III
- Rationale Codes:

Definitions: NA: Not Available.  
 ND: Not Detected.  
 nc: Screening Toxicity Value is based on noncancer effects.  
 ca: Screening Toxicity Value is based on cancer effects.  
 COPC: Chemical of Potential Concern.  
 ARAR/TBC: Applicable or Relevant and Appropriate Requirement/To Be Considered  
 VOCs: Volatile Organic Compounds.  
 ug/kg: microgram per kilogram.  
 ca\*: where nc PRG < 100X ca PRG  
 ca\*\*: where nc PRG < 10X ca PRG

Selection Reason: ASL: Above Screening Level  
 TOX: Chemical is a Class A Carcinogen  
 DET: Relatively few chemicals detected at site, so comparison with screening levels and frequency of detection were not used to eliminate COPCs  
 Deletion Reason: NSL: No Screening Level  
 BSL: Below Screening Level  
 BSL1: Infrequent Detection and Below Screening Level  
 BSL2: Below ARAR/TBC in absence of Screening Level  
 NUT: Essential Nutrient  
 NTX: No Toxicity Information Available  
 NTX1: Infrequent Detection and No Toxicity Information Available  
 IFD: Infrequent Detection  
 STAT: Not a site contaminant according to separate statistical analysis, see text

TABLE A3-2.3A - Parcel Site  
 OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN - Indoor Air  
 Omega Chemical Site - Whittier, California

Scenario Timeframe:	Current/Future
Medium:	Indoor Air
Exposure Medium:	Indoor Air

Exposure Point	CAS Number	Chemical	Minimum Concentration	Maximum Concentration	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Background Value (2)	Screening Toxicity Value (nc/ca) (3)	Potential ARAR/TBC Value	Potential ARAR/TBC Source (4)	COPC Flag (Y/N)	Rationale for Selection or Deletion (5)
Soil Gas	71-55-6	1,1,1-TRICHLOROETHANE	0.038	0.06	ppbv	OC-IA-FS-07-091405	3 / 8	0.027 - 4.6	6.0E-02	NA	5.9E+02			No	BSL
	76-13-1	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	0.21	3.9	ppbv	OC-AA-FD-07-051104	7 / 8	0.027 - 4.6	3.9E+00	NA				Yes	NSL
	75-35-4	1,1-DICHLOROETHENE	0.17	4.4	ppbv	OC-AA-FD-07-051104	7 / 8	0.027 - 4.6	4.4E+00	NA				Yes	NSL
	67-64-1	ACETONE	10	2500	ppbv	OC-IA-FD-09-091405	8 / 8	0.013 - 4.6	2.5E+03	NA				Yes	NSL
	71-43-2	BENZENE	0.81	3.5	ppbv	OC-IA-FS-14-091405	6 / 8	2.000 - 4.6	3.5E+00	NA	4.4E-02			Yes	ASL
	56-23-5	CARBON TETRACHLORIDE	0.091	0.11	ppbv	OC-IA-FS-07-091405	5 / 8	2.000 - 4.6	1.1E-01	NA	1.5E-02			Yes	ASL
	67-86-3	CHLOROFORM	0.039	0.05	ppbv	OC-AA-FS-13-051104	2 / 8	0.027 - 4.6	5.0E-02	NA				Yes	NSL
	75-71-8	DICHLORODIFLUOROMETHANE	0.28	0.62	ppbv	OC-IA-FS-14-091405	6 / 8	0.027 - 4.6	6.2E-01	NA				Yes	NSL
	100-41-4	ETHYLBENZENE	0.73	11	ppbv	OC-AA-FS-09-051104	7 / 8	0.027 - 4.6	1.1E+01	NA	0.0E+00			Yes	ASL
		M,P-XYLENES	3.3	61	ppbv	OC-AA-FS-09-051104	7 / 8	0.670 - 84	6.1E+01	NA	2.3E+02			No	BSL
	75-09-2	METHYLENE CHLORIDE	0.43	74	ppbv	OC-IA-FS-14-091405	6 / 8	0.067 - 8.4	7.4E+01	NA				Yes	NSL
	95-47-6	O-XYLENE	0.66	18	ppbv	OC-AA-FS-09-051104	7 / 8	0.027 - 4.6	1.8E+01	NA	2.3E+02			No	BSL
	127-18-4	TETRACHLOROETHENE	0.15	5.1	ppbv	OC-IA-FS-07-091405	7 / 8	0.027 - 4.6	5.1E+00	NA	1.0E-01			Yes	ASL
	108-88-3	TOLUENE	8.9	620	ppbv	OC-AA-FS-09-051104	8 / 8	0.027 - 4.6	6.2E+02	NA	1.2E+02			Yes	ASL
	79-01-6	TRICHLOROETHENE	0.046	1.2	ppbv	OC-IA-FS-07-091405	6 / 8	2.000 - 4.6	1.2E+00	NA	3.8E-01			Yes	ASL
	75-69-4	TRICHLOROFLUOROMETHANE (FREON 11)	0.35	2.4	ppbv	OC-AA-FD-07-051104	6 / 8	0.027 - 4.6	2.4E+00	NA				Yes	NSL

- (1) Maximum detected concentration from samples located parallel to the current dry cleaning facility used for screening.  
 (2) Maximum detected background concentration.  
 (3) Screened against CalEPA's CHHSLs Indoor Air Screening Levels for Human Health Commercial/Industrial Use (EPA 2005).  
 (4) Rationale Codes:

Definitions: NA: Not Available.  
 ND: Not Detected.  
 nc: Screening Toxicity Value is based on noncancer effects.  
 ca: Screening Toxicity Value is based on cancer effects.  
 COPC: Chemical of Potential Concern.  
 ARAR/TBC: Applicable or Relevant and Appropriate Requirement/To Be Considered  
 ug/m<sup>3</sup>: microgram per cubic meter.

Selection Reason: ASL: Above Screening Level  
 TOX: Chemical is a Class A Carcinogen  
 DET: Relatively few chemicals detected at site, so comparison with screening levels and frequency of detection were not used to eliminate COPCs  
 NSL: No Screening Level  
 Deletion Reason: BSL: Below Screening Level  
 BSL1: Infrequent Detection and Below Screening Level  
 NUT: Essential Nutrient  
 NTX: No Toxicity Information Available  
 NTX1: Infrequent Detection and No Toxicity Information Available  
 IFD: Infrequent Detection

TABLE A3-2.3B - Parcel North  
 OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN - Indoor Air  
 Omega Chemical Site - Whittier, California

Scenario Timeframe:	Current/Future
Medium:	Indoor Air
Exposure Medium:	Indoor Air

Exposure Point	CAS Number	Chemical	Minimum Concentration	Maximum Concentration	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Background Value (2)	Screening Toxicity Value (nc/ca) (3)	Potential ARAR/TBC Value	Potential ARAR/TBC Source (4)	COPC Flag (Y/N)	Rationale for Selection or Deletion (5)
Soil Gas	71-55-6	1,1,1-TRICHLOROETHANE	0.038	0.038	ppbv	OC-AA-FS-10-051104	1 / 5	0.032 - 0.24	3.8E-02	NA	5.9E+02			No	BSL
	76-13-1	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	0.25	5.1	ppbv	OC-AA-FS-10-051104	5 / 5	0.032 - 0.24	5.1E+00	NA				Yes	NSL
	75-35-4	1,1-DICHLOROETHENE	0.74	2.6	ppbv	OC-AA-FS-10-091405	4 / 5	0.016 - 0.12	2.6E+00	NA				Yes	NSL
	106-46-7	1,4-DICHLOROBENZENE	0.034	0.15	ppbv	OC-AA-FS-10-051104	2 / 5	0.032 - 0.24	1.5E-01	NA				Yes	NSL
	67-64-1	ACETONE	9.1	1400	ppbv	OC-AA-FS-10-051104	5 / 5	0.800 - 6	1.4E+03	NA				Yes	NSL
	71-43-2	BENZENE	0.28	0.33	ppbv	OC-AA-FS-10-091405, OC-AA-FS-11-051104	4 / 5	0.080 - 0.6	3.3E-01	NA	4.4E-02			Yes	ASL
	56-23-5	CARBON TETRACHLORIDE	0.1	0.13	ppbv	OC-AA-FS-10-091405, OC-AA-FS-11-051104	4 / 5	0.032 - 0.24	1.3E-01	NA	1.5E-02			Yes	ASL
	67-66-3	CHLOROFORM	0.041	0.066	ppbv	OC-AA-FS-11-091405	3 / 5	0.032 - 0.24	6.6E-02	NA				Yes	NSL
	75-71-8	DICHLORODIFLUOROMETHANE	0.25	0.66	ppbv	OC-AA-FS-10-051104	5 / 5	0.032 - 0.24	6.6E-01	NA				Yes	NSL
	100-41-4	ETHYLBENZENE	0.17	0.19	ppbv	OC-AA-FS-10-051104	4 / 5	0.032 - 0.24	1.9E-01	NA	0.0E+00			Yes	ASL
		M,P-XYLENES	0.49	0.62	ppbv	OC-AA-FS-10-091405	4 / 5	0.064 - 0.48	6.2E-01	NA	2.3E+02			No	BSL
	75-09-2	METHYLENE CHLORIDE	0.48	1.4	ppbv	OC-AA-FS-10-051104	3 / 5	0.320 - 2.4	1.4E+00	NA				Yes	NSL
	95-47-6	O-XYLENE	0.2	0.23	ppbv	OC-AA-FS-10-051104	4 / 5	0.032 - 0.24	2.3E-01	NA	2.3E+02			No	BSL
	127-18-4	TETRACHLOROETHENE	0.62	3.3	ppbv	OC-AA-FS-10-091405	4 / 5	0.032 - 0.24	3.3E+00	NA	1.0E-01			Yes	ASL
	108-88-3	TOLUENE	0.73	2	ppbv	OC-AA-FS-10-091405	5 / 5	0.032 - 0.24	2.0E+00	NA	1.2E+02			No	BSL
	79-01-6	TRICHLOROETHENE	0.42	2.5	ppbv	OC-AA-FS-10-091405	4 / 5	0.032 - 0.24	2.5E+00	NA	3.8E-01			Yes	ASL
	75-69-4	TRICHLOROFLUOROMETHANE (FREON 11)	0.25	2.1	ppbv	OC-AA-FS-10-091405	5 / 5	0.032 - 0.24	2.1E+00	NA				Yes	NSL

- (1) Maximum detected concentration from samples located parallel to the current dry cleaning facility used for screening.  
 (2) Maximum detected background concentration.  
 (3) Screened against CalEPA's CHHSLs Indoor Air Screening Levels for Human Health Commercial/Industrial Use (EPA 2005).  
 (4) Rationale Codes:

Definitions: NA: Not Available.  
 ND: Not Detected.  
 nc: Screening Toxicity Value is based on noncancer effects.  
 ca: Screening Toxicity Value is based on cancer effects.  
 COPC: Chemical of Potential Concern.  
 ARAR/TBC: Applicable or Relevant and Appropriate Requirement/To Be Considered  
 ug/m<sup>3</sup>: microgram per cubic meter.

Selection Reason: ASL: Above Screening Level  
 TOX: Chemical is a Class A Carcinogen  
 DET: Relatively few chemicals detected at site, so comparison with screening levels and frequency of detection were not used to eliminate COPCs  
 NSL: No Screening Level  
 Deletion Reason: BSL: Below Screening Level  
 BSL1: Infrequent Detection and Below Screening Level  
 NUT: Essential Nutrient  
 NTX: No Toxicity Information Available  
 NTX1: Infrequent Detection and No Toxicity Information Available  
 IFD: Infrequent Detection

TABLE A3-2.3C - Parcel West  
 OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN - Indoor Air  
 Omega Chemical Site - Whittier, California

Scenario Timeframe:	Current/Future
Medium:	Indoor Air
Exposure Medium:	Indoor Air

Exposure Point	CAS Number	Chemical	Minimum Concentration	Maximum Concentration	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Background Value (2)	Screening Toxicity Value (nc/ca) (3)	Potential ARAR/TBC Value	Potential ARAR/TBC Source (4)	COPC Flag (Y/N)	Rationale for Selection or Deletion (5)
Soil Gas	71-55-6	1,1,1-TRICHLOROETHANE	0.082	0.088	ppbv	OC-AA-FS-06-051104	2 / 4	0.032 - 0.037	8.8E-02	NA	5.9E+02			No	BSL
	76-13-1	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	0.83	3.4	ppbv	OC-AA-FS-05-051104	4 / 4	0.032 - 0.037	3.4E+00	NA				Yes	NSL
	75-35-4	1,1-DICHLOROETHENE	1.4	5.7	ppbv	OC-AA-FS-05-051104	4 / 4	0.016 - 0.018	5.7E+00	NA				Yes	NSL
	106-46-7	1,4-DICHLOROBENZENE	0.038	0.045	ppbv	OC-IA-FD-05-091405	2 / 4	0.032 - 0.037	4.5E-02	NA				Yes	NSL
	67-64-1	ACETONE	9.2	18	ppbv	OC-AA-FS-06-051104	4 / 4	0.790 - 0.92	1.8E+01	NA				Yes	NSL
	71-43-2	BENZENE	0.36	0.45	ppbv	OC-AA-FS-06-051104	4 / 4	0.079 - 0.092	4.5E-01	NA	4.4E-02			Yes	ASL
	56-23-5	CARBON TETRACHLORIDE	0.087	0.11	ppbv	OC-IA-FD-05-091405	4 / 4	0.032 - 0.037	1.1E-01	NA	1.5E-02			Yes	ASL
	67-66-3	CHLOROFORM	0.042	0.048	ppbv	OC-AA-FS-05-051104	4 / 4	0.032 - 0.037	4.8E-02	NA				Yes	NSL
	75-71-8	DICHLORODIFLUOROMETHANE	0.3	0.58	ppbv	OC-AA-FS-05-051104	4 / 4	0.032 - 0.037	5.8E-01	NA				Yes	NSL
	100-41-4	ETHYLBENZENE	0.21	0.36	ppbv	OC-AA-FS-05-051104	4 / 4	0.032 - 0.037	3.6E-01	NA	0.0E+00			Yes	ASL
		M,P-XYLENES	0.75	1.2	ppbv	-FS-05-051104,OC-AA-FS-06-	4 / 4	0.063 - 0.073	1.2E+00	NA	2.3E+02			No	BSL
	75-09-2	METHYLENE CHLORIDE	0.35	0.43	ppbv	OC-AA-FS-05-051104	4 / 4	0.320 - 0.37	4.3E-01	NA				Yes	NSL
	95-47-6	O-XYLENE	0.22	0.47	ppbv	-FS-05-051104,OC-AA-FS-06-	4 / 4	0.032 - 0.037	4.7E-01	NA	2.3E+02			No	BSL
	127-18-4	TETRACHLOROETHENE	5.7	15	ppbv	OC-AA-FS-05-051104	4 / 4	0.032 - 0.037	1.5E+01	NA	1.0E-01			Yes	ASL
	108-88-3	TOLUENE	1.7	2.6	ppbv	OC-AA-FS-05-051104	4 / 4	0.032 - 0.037	2.6E+00	NA	1.2E+02			No	BSL
	79-01-6	TRICHLOROETHENE	0.3	0.8	ppbv	OC-AA-FS-05-051104	4 / 4	0.032 - 0.037	8.0E-01	NA	3.8E-01			Yes	ASL
	75-69-4	TRICHLOROFLUOROMETHANE (FREON 11)	0.61	1.2	ppbv	-FS-05-051104,OC-AA-FS-06-	4 / 4	0.032 - 0.037	1.2E+00	NA				Yes	NSL

- (1) Maximum detected concentration from samples located parallel to the current dry cleaning facility used for screening.  
 (2) Maximum detected background concentration.  
 (3) Screened against CalEPA's CHHSLs Indoor Air Screening Levels for Human Health Commercial/Industrial Use (EPA 2005).  
 (4) Rationale Codes:

Definitions: NA: Not Available.  
 ND: Not Detected.  
 nc: Screening Toxicity Value is based on noncancer effects.  
 ca: Screening Toxicity Value is based on cancer effects.  
 COPC: Chemical of Potential Concern.  
 ARAR/TBC: Applicable or Relevant and Appropriate Requirement/To Be Considered  
 ug/m<sup>3</sup>: microgram per cubic meter.

Selection Reason: ASL: Above Screening Level  
 TOX: Chemical is a Class A Carcinogen  
 DET: Relatively few chemicals detected at site, so comparison with screening levels and frequency of detection were not used to eliminate COPCs  
 NSL: No Screening Level  
 Deletion Reason: BSL: Below Screening Level  
 BSL1: Infrequent Detection and Below Screening Level  
 NUT: Essential Nutrient  
 NTX: No Toxicity Information Available  
 NTX1: Infrequent Detection and No Toxicity Information Available  
 IFD: Infrequent Detection

TABLE A3-2.3D - Parcel South - Bishop  
 OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN - Indoor Air  
 Omega Chemical Site - Whittier, California

Scenario Timeframe:	Current/Future
Medium:	Indoor Air
Exposure Medium:	Indoor Air

Exposure Point	CAS Number	Chemical	Minimum Concentration	Maximum Concentration	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Background Value (2)	Screening Toxicity Value (nc/ca) (3)	Potential ARAR/TBC Value	Potential ARAR/TBC Source (4)	COPC Flag (Y/N)	Rationale for Selection or Deletion (5)
Soil Gas	71-55-6	1,1,1-TRICHLOROETHANE	0.036	0.036	ppbv	OC-IA-BIS-STORE-090806	1 / 3	0.030 - 0.062	3.6E-02	NA	5.9E+02			No	BSL
	76-13-1	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	0.44	1.3	ppbv	OC-IA-BIS-STORE-090806	3 / 3	0.030 - 0.062	1.3E+00	NA				Yes	NSL
	75-35-4	1,1-DICHLOROETHENE	0.9	3.6	ppbv	OC-IA-BIS-STORE-090806	3 / 3	0.015 - 0.031	3.6E+00	NA				Yes	NSL
	106-46-7	1,4-DICHLOROBENZENE	0.036	0.053	ppbv	OC-IA-BIS-AO-090806	2 / 3	0.030 - 0.062	5.3E-02	NA				Yes	NSL
	67-64-1	ACETONE	12	17.35	ppbv	OC-IA-BIS-AO-090806	3 / 3	0.740 - 1.6	1.7E+01	NA				Yes	NSL
	71-43-2	BENZENE	0.355	0.39	ppbv	OC-IA-BIS-STORE-090806	3 / 3	0.074 - 0.16	3.9E-01	NA	4.4E-02			Yes	ASL
	56-23-5	CARBON TETRACHLORIDE	0.081	0.091	ppbv	OC-IA-BIS-AO-090806	3 / 3	0.030 - 0.062	9.1E-02	NA	1.5E-02			Yes	ASL
	67-66-3	CHLOROFORM	0.032	0.036	ppbv	OC-IA-BIS-STORE-090806	2 / 3	0.030 - 0.062	3.6E-02	NA				Yes	NSL
	75-71-8	DICHLORODIFLUOROMETHANE	0.55	0.605	ppbv	OC-IA-BIS-AO-090806	3 / 3	0.030 - 0.062	6.1E-01	NA				Yes	NSL
	100-41-4	ETHYLBENZENE	0.19	0.4	ppbv	OC-IA-BIS-STORE-090806	3 / 3	0.030 - 0.062	4.0E-01	NA	0.0E+00			Yes	ASL
		M,P-XYLENES	0.615	1.1	ppbv	OC-IA-BIS-STORE-090806	3 / 3	0.060 - 0.12	1.1E+00	NA	2.3E+02			No	BSL
	1634-04-4	METHYL TERT-BUTYL ETHER	0.19	0.19	ppbv	OC-IA-BIS-STORE-090806	1 / 3	0.150 - 0.31	1.9E-01	NA	4.4E+00			No	BSL
	75-09-2	METHYLENE CHLORIDE	0.29	0.49	ppbv	OC-IA-BIS-STORE-090806	2 / 3	0.300 - 0.62	4.9E-01	NA				Yes	NSL
	95-47-6	O-XYLENE	0.23	0.39	ppbv	OC-IA-BIS-STORE-090806	3 / 3	0.030 - 0.062	3.9E-01	NA	2.3E+02			No	BSL
	127-18-4	TETRACHLOROETHENE	1	4.3	ppbv	OC-IA-BIS-STORE-090806	3 / 3	0.030 - 0.062	4.3E+00	NA	1.0E-01			Yes	ASL
	108-88-3	TOLUENE	1.8	2.2	ppbv	OC-IA-BIS-STORE-090806	3 / 3	0.030 - 0.062	2.2E+00	NA	1.2E+02			No	BSL
	79-01-6	TRICHLOROETHENE	0.083	0.28	ppbv	OC-IA-BIS-STORE-090806	3 / 3	0.030 - 0.062	2.8E-01	NA	3.8E-01			No	BSL
	75-69-4	TRICHLOROFLUOROMETHANE (FREON 11)	0.39	0.65	ppbv	OC-IA-BIS-STORE-090806	3 / 3	0.030 - 0.062	6.5E-01	NA				Yes	NSL

- (1) Maximum detected concentration from samples located parallel to the current dry cleaning facility used for screening.  
 (2) Maximum detected background concentration.  
 (3) Screened against CalEPA's CHHSLs Indoor Air Screening Levels for Human Health Commercial/Industrial Use (EPA 2005).  
 (4) Rationale Codes:

Definitions: NA: Not Available.  
 ND: Not Detected.  
 nc: Screening Toxicity Value is based on noncancer effects.  
 ca: Screening Toxicity Value is based on cancer effects.  
 COPC: Chemical of Potential Concern.  
 ARAR/TBC: Applicable or Relevant and Appropriate Requirement/To Be Considered  
 ug/m<sup>3</sup>: microgram per cubic meter.

Selection Reason: ASL: Above Screening Level  
 TOX: Chemical is a Class A Carcinogen  
 DET: Relatively few chemicals detected at site, so comparison with screening levels and frequency of detection were not used to eliminate COPCs  
 NSL: No Screening Level  
 Deletion Reason: BSL: Below Screening Level  
 BSL1: Infrequent Detection and Below Screening Level  
 NUT: Essential Nutrient  
 NTX: No Toxicity Information Available  
 NTX1: Infrequent Detection and No Toxicity Information Available  
 IFD: Infrequent Detection

TABLE A3-2.3E - Parcel South - LA Carts/Oncology Care  
 OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN - Indoor Air  
 Omega Chemical Site - Whittier, California

Scenario Timeframe:	Current/Future
Medium:	Indoor Air
Exposure Medium:	Indoor Air

Exposure Point	CAS Number	Chemical	Minimum Concentration	Maximum Concentration	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Background Value (2)	Screening Toxicity Value (nc/ca) (3)	Potential ARAR/TBC Value	Potential ARAR/TBC Source (4)	COPC Flag (Y/N)	Rationale for Selection or Deletion (5)	
Soil Gas	76-13-1	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	0.092	1.9	ppbv	OC-IA-LAC-Sm Prod-090806	5 / 5	0.027 - 0.16	1.9E+00	NA				Yes	NSL	
	75-35-4	1,1-DICHLOROETHENE	0.015	0.92	ppbv	OC-IA-LAC-Sm Prod-090806	5 / 5	0.013 - 0.082	9.2E-01	NA				Yes	NSL	
	107-06-2	1,2-DICHLOROETHANE	0.08	0.08	ppbv	OC-IA-ONC-NS-090806	1 / 5	0.027 - 0.16	8.0E-02	NA	4.8E-02			Yes	ASL	
	106-46-7	1,4-DICHLOROBENZENE	0.028	0.065	ppbv	OC-IA-ONC-NS-090806	2 / 5	0.027 - 0.16	6.5E-02	NA				Yes	NSL	
	67-64-1	ACETONE	31	490	ppbv	OC-IA-LAC-Sm Prod-090806	5 / 5	0.670 - 4.1	4.9E+02	NA				Yes	NSL	
	71-43-2	BENZENE	0.36	0.68	ppbv	OC-IA-LAC-Lg Prod-090806	5 / 5	0.067 - 0.41	6.8E-01	NA	4.4E-02			Yes	ASL	
	56-23-5	CARBON TETRACHLORIDE	0.079	0.083	ppbv	OC-IA-ONC-AO-090806	4 / 5	0.027 - 0.16	8.3E-02	NA	1.5E-02			Yes	ASL	
	67-66-3	CHLOROFORM	0.029	0.14	ppbv	OC-IA-ONC-AO-090806	4 / 5	0.027 - 0.16	1.4E-01	NA				Yes	NSL	
	75-71-8	DICHLORODIFLUOROMETHANE	0.52	0.68	ppbv	OC-IA-ONC-NS-090806	5 / 5	0.027 - 0.16	6.8E-01	NA				Yes	NSL	
	100-41-4	ETHYLBENZENE	0.22	0.47	ppbv	OC-IA-LAC-Lg Prod-090806	5 / 5	0.027 - 0.16	4.7E-01	NA	0.0E+00			Yes	ASL	
	75-09-2	M,P-XYLENES	0.67	1.7	ppbv	OC-IA-LAC-Lg Prod-090806	5 / 5	0.054 - 0.33	1.7E+00	NA	2.3E+02			No	BSL	
	95-47-6	METHYLENE CHLORIDE	1.5	1.7	ppbv	OC-IA-LAC-Lg Prod-090806	2 / 5	0.270 - 1.6	1.7E+00	NA				Yes	NSL	
	127-18-4	O-XYLENE	0.24	0.59	ppbv	OC-IA-LAC-Lg Prod-090806	5 / 5	0.027 - 0.16	5.9E-01	NA	2.3E+02			No	BSL	
	108-88-3	TETRACHLOROETHENE	0.036	0.24	ppbv	OC-IA-LAC-Lg Prod-090806	3 / 5	0.027 - 0.16	2.4E-01	NA	1.0E-01			Yes	ASL	
	79-01-6	TOLUENE	2.8	150.0	ppbv	OC-IA-LAC-Sm Prod-090806	5 / 5	0.027 - 0.16	1.5E+02	NA	1.2E+02			Yes	ASL	
	75-69-4	TRICHLOROETHENE	0.22	0.22	ppbv	OC-IA-LAC-AO-090806	1 / 5	0.027 - 0.16	2.2E-01	NA	3.8E-01			No	BSL	
			TRICHLOROFLUOROMETHANE (FREON 11)	0.26	0.57	ppbv	OC-IA-LAC-Sm Prod-090806	5 / 5	0.027 - 0.16	5.7E-01	NA				Yes	NSL

- (1) Maximum detected concentration from samples located parallel to the current dry cleaning facility used for screening.  
 (2) Maximum detected background concentration.  
 (3) Screened against CalEPA's CHHSLs Indoor Air Screening Levels for Human Health Commercial/Industrial Use (EPA 2005).  
 (4) Rationale Codes:

Definitions:  
 NA: Not Available.  
 ND: Not Detected.  
 nc: Screening Toxicity Value is based on noncancer effects.  
 ca: Screening Toxicity Value is based on cancer effects.  
 COPC: Chemical of Potential Concern.  
 ARAR/TBC: Applicable or Relevant and Appropriate Requirement/To Be Considered  
 ug/m<sup>3</sup>: microgram per cubic meter.

Selection Reason: ASL: Above Screening Level  
 TOX: Chemical is a Class A Carcinogen  
 DET: Relatively few chemicals detected at site, so comparison with screening levels and frequency of detection were not used to eliminate COPCs  
 NSL: No Screening Level  
 Deletion Reason: BSL: Below Screening Level  
 BSL1: Infrequent Detection and Below Screening Level  
 NUT: Essential Nutrient  
 NTX: No Toxicity Information Available  
 NTX1: Infrequent Detection and No Toxicity Information Available  
 IFD: Infrequent Detection

TABLE A3-2.4 - Parcel South - Skateland  
 OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN - Soil Gas  
 Omega Chemical Site - Whittier, California

Scenario Timeframe:	Current/Future
Medium:	Soil Gas
Exposure Medium:	Indoor Air

Exposure Point	CAS Number	Chemical	Minimum Concentration	Maximum Concentration	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Background Value (2)	Screening Toxicity Value (nc/ca) (3)	Potential ARAR/TBC Value	Potential ARAR/TBC Source (4)	COPC Flag (Y/N)	Rationale for Selection or Deletion (5)	
Soil Gas	76-13-1	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	240	330000	ppbv	OC1-SG14A-G-0-28	7 / 7	1.4 - 670	3.3E+05	NA				Yes	NSL	
	75-35-4	1,1-DICHLOROETHENE	21	210000	ppbv	OC1-SG14A-G-0-28	7 / 7	1.4 - 670	2.1E+05	NA				Yes	NSL	
	95-63-6	1,2,4-TRIMETHYLBENZENE	3	3	ppbv	UC-4B	1 / 7	1.4 - 1900	3.0E+00	NA				Yes	NSL	
		2,2,4-TRIMETHYLPENTANE	4.2	12	ppbv	UC-10	3 / 6	1.4 - 670	1.2E+01	NA				Yes	NSL	
	78-93-3	2-BUTANONE	2.6	2.6	ppbv	UC-4B	1 / 6	1.4 - 670	2.6E+00	NA				Yes	NSL	
		4-ETHYLTOLUENE	2.4	2.4	ppbv	UC-4B	1 / 6	1.4 - 670	2.4E+00	NA				Yes	NSL	
	67-64-1	ACETONE	35	78	ppbv	SG-15-6FT	4 / 6	5.8 - 2700	7.8E+01	NA				Yes	NSL	
	71-43-2	BENZENE	2.6	5.1	ppbv	SG-15-6FT	2 / 7	1.4 - 1900	5.1E+00	NA	3.8E+01				No	BSL
	75-15-0	CARBON DISULFIDE	3.6	3.6	ppbv	UC-4B	1 / 6	1.4 - 670	3.6E+00	NA				Yes	NSL	
	67-66-3	CHLOROFORM	2.5	2.5	ppbv	UC-4B	1 / 7	1.4 - 1900	2.5E+00	NA				Yes	NSL	
	75-71-8	DICHLORODIFLUOROMETHANE	2.8	1900	ppbv	OC1-SG14A-G-0-28	5 / 7	1.4 - 670	1.9E+03	NA				Yes	NSL	
	110-54-3	HEXANE (N-HEXANE)	3	3	ppbv	UC-10	1 / 6	1.4 - 670	3.0E+00	NA				Yes	NSL	
		M,P-XYLENES	3.2	7	ppbv	SG-15-6FT	3 / 7	1.4 - 3800	7.0E+00	NA	2.0E+05				No	BSL
	127-18-4	TETRACHLOROETHENE	140	13000	ppbv	OC1-SG14A-G-0-28	7 / 7	1.4 - 670	1.3E+04	NA	8.9E+01			Yes	ASL	
	108-88-3	TOLUENE	7.8	690	ppbv	SG-14-6FT	4 / 7	1.4 - 1900	6.9E+02	NA	1.0E+05			No	BSL	
	79-01-6	TRICHLOROETHENE	36	7800	ppbv	OC1-SG14A-G-0-28	7 / 7	1.4 - 670	7.8E+03	NA	3.3E+02			Yes	ASL	
	75-69-4	TRICHLOROFLUOROMETHANE (FREON 11)	98	94000	ppbv	OC1-SG14A-G-0-28	7 / 7	1.4 - 670	9.4E+04	NA				Yes	NSL	

- (1) Maximum detected concentration from onsite samples  
 (2) Maximum detected background concentration.  
 (3) Screened against EPA's Shallow Soil Gas Screening Levels for Human Health (Vapor Intrusion) for Commercial/Industrial Use (EPA 2005).  
 (4) Rationale Codes:

Definitions:  
 NA: Not Available.  
 ND: Not Detected.  
 nc: Screening Toxicity Value is based on noncancer effects.  
 ca: Screening Toxicity Value is based on cancer effects.  
 COPC: Chemical of Potential Concern.  
 ARAR/TBC: Applicable or Relevant and Appropriate Requirement/To Be Considered  
 ug/m<sup>3</sup>: microgram per cubic meter.

Selection Reason: ASL: Above Screening Level  
 TOX: Chemical is a Class A Carcinogen  
 DET: Relatively few chemicals detected at site, so comparison with screening levels and frequency of detection were not used to eliminate COPCs  
 NSL: No Screening Level  
 Deletion Reason: BSL: Below Screening Level  
 BSL1: Infrequent Detection and Below Screening Level  
 BSL2: Below ARAR/TBC in absence of Screening Level  
 NUT: Essential Nutrient  
 NTX: No Toxicity Information Available  
 NTX1: Infrequent Detection and No Toxicity Information Available  
 IFD: Infrequent Detection

TABLE A3-3.1A - Parcel Site  
MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY  
Omega Chemical Site - Whittier, California

Scenario Timeframe:	Current/Future
Medium:	Surface Soil
Exposure Medium:	Surface Soil

Exposure Point	Chemical of Potential Concern	Units	Arithmetic Mean <sup>(1)</sup>	95% UCL of Distribution <sup>(1)</sup>	Maximum Detected Concentration	Exposure Point Concentrations			
						Value	Units	Statistic <sup>(2)</sup>	Rationale
Surface Soil	2-METHYLNAPHTHALENE	mg/kg	0.72	3.3	0.48	0.48	mg/kg	Max	UCL is greater than Max
	BIS(2-ETHYLHEXYL)PHTHALATE	mg/kg	4.5	19.4	51	19.4	mg/kg	95% UCL-T	
	CHROMIUM	mg/kg	38.1	98.9	308.6	98.9	mg/kg	UCL-NP	
	CHROMIUM VI	mg/kg	6.4	16.5	51.4	16.5	mg/kg	UCL-NP	
	DIELDRIN	mg/kg	0.006	0.016	0.05	0.016	mg/kg	UCL-NP	
	IRON	mg/kg	22,650.0	NO UCL	23200	23200	mg/kg	Max	
	LEAD	mg/kg	32.2	44.4	100	44.4	mg/kg	95% UCL-G	
	NAPHTHALENE	mg/kg	0.75	3.4	1.2	1.2	mg/kg	Max	
	PCB-1254 (AROCLOR 1254)	mg/kg	0.03	0.25	0.50	0.25	mg/kg	UCL-NP	
	PHENANTHRENE	mg/kg	0.75	3.6	0.03	0.03	mg/kg	Max	

Statistics: Maximum Detected Value (Max); 95% UCL of Normal Data (95% UCL-N); 95% UCL of Log-transformed Data (95% UCL-T); Non-parametric (UCL-NP); 95% UCL assuming Gamma distribution (95% G-UCL).

(1) The arithmetic mean and the 95UCL were calculated including half the detection limit for the non-detects. As a result, in some cases these values are above the maximum detected.

(2) The Shapiro-Wilk test was used to test the normality/ lognormality of all data sets at the 0.05 significance level. The UCL procedures listed were selected based on the recommendations of the ProUCL statistical program and based on the results of the W Test, the number of samples, and the standard deviation of the log-transformed data.

mg/kg: milligram per kilogram.

TABLE A3-3.2A - Parcel Site  
MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY  
Omega Chemical Site - Whittier, California

Scenario Timeframe:	Future
Medium:	Surface/Subsurface Soil
Exposure Medium:	Surface/Subsurface Soil

Exposure Point	Chemical of Potential Concern	Units	Arithmetic Mean <sup>(1)</sup>	95% UCL of Distribution <sup>(1)</sup>	Maximum Detected Concentration	Exposure Point Concentrations			
						Value	Units	Statistic <sup>(2)</sup>	Rationale
Surface/Subsurface	1,1,1-TRICHLOROETHANE	mg/kg	33.6	264	1,200	264	mg/kg	UCL-NP	UCL is greater than Max
	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	mg/kg	16.8	125	590	125	mg/kg	UCL-NP	
	1,1-DICHLOROETHENE	mg/kg	2.09	12.6	60.0	12.6	mg/kg	UCL-NP	
	1,2-DICHLOROETHANE	mg/kg	1.60	8.44	1.6	1.60	mg/kg	Max	
	1,4-DIOXANE	mg/kg	2.69	15.9	41.0	15.9	mg/kg	UCL-NP	
	2-METHYLNAPHTHALENE	mg/kg	0.45	1.84	0.54	0.54	mg/kg	Max	
	BENZO(A)ANTHRACENE	mg/kg	0.51	2.08	2.4	2.08	mg/kg	UCL-NP	
	BENZO(A)PYRENE	mg/kg	0.49	2.01	1.6	1.60	mg/kg	Max	
	BENZO(B)FLUORANTHENE	mg/kg	0.47	1.97	0.91	0.91	mg/kg	Max	
	BIS(2-ETHYLHEXYL)PHTHALATE	mg/kg	2.72	15.3	51.0	15.3	mg/kg	UCL-NP	
	CHROMIUM	mg/kg	36.9	77.2	360	77.2	mg/kg	UCL-NP	
	CHROMIUM VI	mg/kg	5.27	11.0	51.4	11.0	mg/kg	UCL-NP	
	DIELDRIN	mg/kg	0.007	0.035	0.05	0.035	mg/kg	UCL-NP	
	IRON	mg/kg	22,925	23,579	23,200	23,200	mg/kg	Max	
	LEAD	mg/kg	48.1	54	890	54	mg/kg	95% UCL-T	
	METHYLENE CHLORIDE	mg/kg	3.26	21	100	21	mg/kg	UCL-NP	
	NAPHTHALENE	mg/kg	0.34	0.99	1.2	0.99	mg/kg	UCL-NP	
	PCB-1254 (AROCLOR 1254)	mg/kg	0.028	0.081	0.5	0.081	mg/kg	UCL-NP	
	PHENANTHRENE	mg/kg	0.56	2.39	5.00	2.39	mg/kg	UCL-NP	
	TETRACHLOROETHENE	mg/kg	51.6	317	1300	317	mg/kg	UCL-NP	
TOLUENE	mg/kg	2.13	13.1	62.0	13.1	mg/kg	UCL-NP		
TRICHLOROETHENE	mg/kg	4.40	30	140	30	mg/kg	UCL-NP		
TRICHLOROFLUOROMETHANE (FREON 11)	mg/kg	6.55	47	220	47	mg/kg	UCL-NP		

Statistics: Maximum Detected Value (Max); 95% UCL of Normal Data (95% UCL-N); 95% UCL of Log-transformed Data (95% UCL-T); Non-parametric (UCL-NP); 95% UCL assuming Gamma distribution (95% G-UCL).

(1) The arithmetic mean and the 95UCL were calculated including half the detection limit for the non-detects. As a result, in some cases these values are above the maximum detected.

(2) The Shapiro-Wilk test was used to test the normality/ lognormality of all data sets at the 0.05 significance level. The UCL procedures listed were selected based on the recommendations of the ProUCL statistical program and based on the results of the W Test, the number of samples, and the standard deviation of the log-transformed data.

ND: Not detected.

mg/kg: milligram per kilogram.

TABLE A3-3.3A - Parcel Site  
MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY  
Omega Chemical Site - Whittier, California

Scenario Timeframe:	Current/Future
Medium:	Soil Gas
Exposure Medium:	Indoor Air

Exposure Point	Chemical of Potential Concern	Units	Arithmetic Mean <sup>(1)</sup>	95% UCL of Distribution <sup>(1)</sup>	Maximum Detected Concentration	Exposure Point Concentrations <sup>(2)</sup>					
						Value	Units	Converted Value <sup>(2)</sup>	Units	Statistic <sup>(3)</sup>	Rationale
Indoor Air	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	ppbv	1.3	2.2	3.9	2.2	ppbv	16.9	ug/m <sup>3</sup>	95% UCL-N	UCL is greater than Max
	1,1-DICHLOROETHENE	ppbv	1.7	2.8	4.4	2.8	ppbv	15.5	ug/m <sup>3</sup>	95% UCL-N	
	ACETONE	ppbv	672.9	4,540	2,500	2,500	ppbv	5,939	ug/m <sup>3</sup>	Max	
	BENZENE	ppbv	1.9	3.1	3.50	3.1	ppbv	9.7	ug/m <sup>3</sup>	95% UCL-G	
	CARBON TETRACHLORIDE	ppbv	0.3	2.3	0.11	0.11	ppbv	0.69	ug/m <sup>3</sup>	Max	
	CHLOROFORM	ppbv	0.3	1.3	0.05	0.05	ppbv	0.24	ug/m <sup>3</sup>	Max	
	DICHLORODIFLUOROMETHANE	ppbv	0.6	1.0	0.62	0.62	ppbv	3.07	ug/m <sup>3</sup>	Max	
	ETHYLBENZENE	ppbv	2.8	5.9	11	5.9	ppbv	25.6	ug/m <sup>3</sup>	95% UCL-G	
	METHYLENE CHLORIDE	ppbv	13.9	77.7	74	74	ppbv	257	ug/m <sup>3</sup>	Max	
	TETRACHLOROETHENE	ppbv	1.7	2.7	5.1	2.7	ppbv	18.4	ug/m <sup>3</sup>	95% UCL-N	
	TOLUENE	ppbv	104.8	525.4	620	525	ppbv	1,980	ug/m <sup>3</sup>	95% UCL-G assumed	
	TRICHLOROETHENE	ppbv	0.6	1.0	1.2	0.99	ppbv	5.32	ug/m <sup>3</sup>	95% UCL-N	
TRICHLOROFLUOROMETHANE (FREON 11)	ppbv	1.1	1.6	2.4	1.6	ppbv	9.0	ug/m <sup>3</sup>	95% UCL-N		

Statistics: Maximum Detected Value (Max); 95% UCL of Normal Data (95% UCL-N); 95% UCL of Log-transformed Data (95% UCL-T); Non-parametric (UCL-NP); 95% UCL assuming Gamma distribution (95% G-UCL).

(1) The arithmetic mean and the 95UCL were calculated including half the detection limit for the non-detects. As a result, in some cases these values are above the maximum detected.

(2) Values converted using an online units calculator: <http://www.airtoxics.com/c/classes/unitcalc.html>.

(3) The Shapiro-Wilk test was used to test the normality/ lognormality of all data sets at the 0.05 significance level. The UCL procedures listed were selected based on the recommendations of the ProUCL statistical program and based on the results of the W Test, the number of samples, and the standard deviation of the log-transformed data.

ug/m<sup>3</sup>: microgram per cubic meter.

ppbv: parts per billion by volume

TABLE A3-3.3B - Parcel North  
MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY  
Omega Chemical Site - Whittier, California

Scenario Timeframe:	Current/Future
Medium:	Soil Gas
Exposure Medium:	Indoor Air

Exposure Point	Chemical of Potential Concern	Units	Arithmetic Mean <sup>(1)</sup>	95% UCL of Distribution <sup>(1)</sup>	Maximum Detected Concentration	Exposure Point Concentrations <sup>(2)</sup>					
						Value	Units	Converted Value <sup>(2)</sup>	Units	Statistic <sup>(3)</sup>	Rationale
Indoor Air	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	ppbv	3.3	5.3	5.1	5.1	ppbv	39	ug/m <sup>3</sup>	Max	UCL is greater than Max
	1,1-DICHLOROETHENE	ppbv	1.3	2.2	2.6	2.2	ppbv	8.7	ug/m <sup>3</sup>	95% UCL-N	
	1,4-DICHLOROBENZENE	ppbv	0.07	0.13	0.15	0.13	ppbv	0.78	ug/m <sup>3</sup>	95% UCL-N	
	ACETONE	ppbv	365	6,982	1400	1400	ppbv	3,326	ug/m <sup>3</sup>	Max	
	BENZENE	ppbv	0.31	0.33	0.33	0.33	ppbv	1.1	ug/m <sup>3</sup>	Max	
	CARBON TETRACHLORIDE	ppbv	0.14	0.17	0.13	0.13	ppbv	0.82	ug/m <sup>3</sup>	Max	
	CHLOROFORM	ppbv	0.07	0.10	0.066	0.066	ppbv	0.34	ug/m <sup>3</sup>	Max	
	DICHLORODIFLUOROMETHANE	ppbv	0.46	0.61	0.66	0.61	ppbv	3.0	ug/m <sup>3</sup>	95% UCL-N	
	ETHYLBENZENE	ppbv	0.17	0.19	0.19	0.19	ppbv	0.82	ug/m <sup>3</sup>	Max	
	METHYLENE CHLORIDE	ppbv	0.87	1.4	1.4	1.4	ppbv	4.9	ug/m <sup>3</sup>	95% UCL-N	
	TETRACHLOROETHENE	ppbv	1.1	4.2	3.3	3.3	ppbv	22	ug/m <sup>3</sup>	Max	
	TRICHLOROETHENE	ppbv	0.80	2.92	2.5	2.5	ppbv	13	ug/m <sup>3</sup>	Max	
	TRICHLOROFLUOROMETHANE (FREON 11)	ppbv	1.3	2.0	2.1	2.0	ppbv	11	ug/m <sup>3</sup>	95% UCL-N	

Statistics: Maximum Detected Value (Max); 95% UCL of Normal Data (95% UCL-N); 95% UCL of Log-transformed Data (95% UCL-T); Non-parametric (UCL-NP); 95% UCL assuming Gamma distribution (95% G-UCL).

(1) The arithmetic mean and the 95UCL were calculated including half the detection limit for the non-detects. As a result, in some cases these values are above the maximum detected.

(2) Values converted using an online units calculator: <http://www.airtoxics.com/c/classes/unitcalc.html>.

(3) The Shapiro-Wilk test was used to test the normality/ lognormality of all data sets at the 0.05 significance level. The UCL procedures listed were selected based on the recommendations of the ProUCL statistical program and based on the results of the W Test, the number of samples, and the standard deviation of the log-transformed data.

ug/m<sup>3</sup>: microgram per cubic meter.

ppbv: parts per billion by volume

TABLE A3-3.3C - Parcel West  
MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY  
Omega Chemical Site - Whittier, California

Scenario Timeframe:	Current/Future
Medium:	Soil Gas
Exposure Medium:	Indoor Air

Exposure Point	Chemical of Potential Concern	Units	Arithmetic Mean <sup>(1)</sup>	95% UCL of Distribution <sup>(1)</sup>	Maximum Detected Concentration	Exposure Point Concentrations <sup>(2)</sup>					
						Value	Units	Converted Value <sup>(2)</sup>	Units	Statistic <sup>(3)</sup>	Rationale
Indoor Air	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	ppbv	1.88	No UCL	3.40	3.40	ppbv	26.1	ug/m <sup>3</sup>	Max	Too Few Samples for UCL
	1,1-DICHLOROETHENE	ppbv	3.10	No UCL	5.70	5.70	ppbv	22.6	ug/m <sup>3</sup>	Max	Too Few Samples for UCL
	1,4-DICHLOROBENZENE	ppbv	0.025	No UCL	0.05	0.05	ppbv	0.30	ug/m <sup>3</sup>	Max	Too Few Samples for UCL
	ACETONE	ppbv	11.1	No UCL	18	18	ppbv	42.8	ug/m <sup>3</sup>	Max	Too Few Samples for UCL
	BENZENE	ppbv	0.31	No UCL	0.45	0.45	ppbv	1.44	ug/m <sup>3</sup>	Max	Too Few Samples for UCL
	CARBON TETRACHLORIDE	ppbv	0.074	No UCL	0.11	0.11	ppbv	0.69	ug/m <sup>3</sup>	Max	Too Few Samples for UCL
	CHLOROFORM	ppbv	0.034	No UCL	0.05	0.05	ppbv	0.24	ug/m <sup>3</sup>	Max	Too Few Samples for UCL
	DICHLORODIFLUOROMETHANE	ppbv	0.38	No UCL	0.58	0.58	ppbv	2.87	ug/m <sup>3</sup>	Max	Too Few Samples for UCL
	ETHYLBENZENE	ppbv	0.23	No UCL	0.36	0.36	ppbv	1.56	ug/m <sup>3</sup>	Max	Too Few Samples for UCL
	METHYLENE CHLORIDE	ppbv	0.29	No UCL	0.43	0.43	ppbv	1.49	ug/m <sup>3</sup>	Max	Too Few Samples for UCL
	TETRACHLOROETHENE	ppbv	8.68	No UCL	15	15	ppbv	102	ug/m <sup>3</sup>	Max	Too Few Samples for UCL
	TRICHLOROETHENE	ppbv	0.46	No UCL	0.80	0.80	ppbv	4.30	ug/m <sup>3</sup>	Max	Too Few Samples for UCL
TRICHLOROFLUOROMETHANE (FREON 11)	ppbv	0.75	No UCL	1.20	1.20	ppbv	6.74	ug/m <sup>3</sup>	Max	Too Few Samples for UCL	

Statistics: Maximum Detected Value (Max); 95% UCL of Normal Data (95% UCL-N); 95% UCL of Log-transformed Data (95% UCL-T); Non-parametric (UCL-NP); 95% UCL assuming Gamma distribution (95% G-UCL).

(1) The arithmetic mean and the 95UCL were calculated including half the detection limit for the non-detects. As a result, in some cases these values are above the maximum detected.

(2) Values converted using an online units calculator: <http://www.airtoxics.com/c/classes/unitcalc.html>.

(3) The Shapiro-Wilk test was used to test the normality/ lognormality of all data sets at the 0.05 significance level. The UCL procedures listed were selected based on the recommendations of the ProUCL statistical program and based on the results of the W Test, the number of samples, and the standard deviation of the log-transformed data.

ug/m<sup>3</sup>: microgram per cubic meter.

ppbv: parts per billion by volume

TABLE A3-3.3D - Parcel South - Bishop  
MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY  
Omega Chemical Site - Whittier, California

Scenario Timeframe:	Current/Future
Medium:	Soil Gas
Exposure Medium:	Indoor Air

Exposure Point	Chemical of Potential Concern	Units	Arithmetic Mean <sup>(1)</sup>	95% UCL of Distribution <sup>(1)</sup>	Maximum Detected Concentration	Exposure Point Concentrations <sup>(2)</sup>					
						Value	Units	Converted Value <sup>(2)</sup>	Units	Statistic <sup>(3)</sup>	Rationale
Indoor Air	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	ppbv	0.75	No UCL	1.3	1.3	ppbv	9.96	ug/m <sup>3</sup>	Max	Too Few Samples for UCL
	1,1-DICHLOROETHENE	ppbv	1.95	No UCL	3.6	3.6	ppbv	14.27	ug/m <sup>3</sup>	Max	Too Few Samples for UCL
	1,4-DICHLOROBENZENE	ppbv	0.04	No UCL	0.053	0.053	ppbv	0.32	ug/m <sup>3</sup>	Max	Too Few Samples for UCL
	ACETONE	ppbv	14.12	No UCL	17.35	17.35	ppbv	41.21	ug/m <sup>3</sup>	Max	Too Few Samples for UCL
	BENZENE	ppbv	0.38	No UCL	0.39	0.39	ppbv	1.25	ug/m <sup>3</sup>	Max	Too Few Samples for UCL
	CARBON TETRACHLORIDE	ppbv	0.09	No UCL	0.091	0.091	ppbv	0.57	ug/m <sup>3</sup>	Max	Too Few Samples for UCL
	CHLOROFORM	ppbv	0.03	No UCL	0.036	0.036	ppbv	0.18	ug/m <sup>3</sup>	Max	Too Few Samples for UCL
	DICHLORODIFLUOROMETHANE	ppbv	0.58	No UCL	0.605	0.605	ppbv	2.99	ug/m <sup>3</sup>	Max	Too Few Samples for UCL
	ETHYLBENZENE	ppbv	0.28	No UCL	0.4	0.4	ppbv	1.74	ug/m <sup>3</sup>	Max	Too Few Samples for UCL
	METHYLENE CHLORIDE	ppbv	0.31	No UCL	0.49	0.49	ppbv	1.7	ug/m <sup>3</sup>	Max	Too Few Samples for UCL
	TETRACHLOROETHENE	ppbv	2.27	No UCL	4.3	4.3	ppbv	29.17	ug/m <sup>3</sup>	Max	Too Few Samples for UCL
TRICHLOROFLUOROMETHANE (FREON 11)	ppbv	0.49	No UCL	0.65	0.65	ppbv	3.65	ug/m <sup>3</sup>	Max	Too Few Samples for UCL	

Statistics: Maximum Detected Value (Max); 95% UCL of Normal Data (95% UCL-N); 95% UCL of Log-transformed Data (95% UCL-T); Non-parametric (UCL-NP); 95% UCL assuming Gamma distribution (95% G-UCL).

(1) The arithmetic mean and the 95UCL were calculated including half the detection limit for the non-detects. As a result, in some cases these values are above the maximum detected.

(2) Values converted using an online units calculator: <http://www.airtoxics.com/cclasses/unitcalc.html>.

(3) The Shapiro-Wilk test was used to test the normality/ lognormality of all data sets at the 0.05 significance level. The UCL procedures listed were selected based on the recommendations of the ProUCL statistical program and based on the results of the W Test, the number of samples, and the standard deviation of the log-transformed data.

ug/m<sup>3</sup>: microgram per cubic meter.

ppbv: parts per billion by volume

TABLE A3-3.3E - Parcel South - LA Carts/Oncology Care  
MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY  
Omega Chemical Site - Whittier, California

Scenario Timeframe:	Current/Future
Medium:	Soil Gas
Exposure Medium:	Indoor Air

Exposure Point	Chemical of Potential Concern	Units	Arithmetic Mean <sup>(1)</sup>	95% UCL of Distribution <sup>(1)</sup>	Maximum Detected Concentration	Exposure Point Concentrations <sup>(2)</sup>					
						Value	Units	Converted Value <sup>(2)</sup>	Units	Statistic <sup>(3)</sup>	Rationale
Indoor Air	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	ppbv	0.69	1.45	1.9	1.45	ppbv	11.11	ug/m <sup>3</sup>	95% UCL-N	UCL is greater than Max UCL is greater than Max
	1,1-DICHLOROETHENE	ppbv	0.33	0.73	0.92	0.73	ppbv	2.89	ug/m <sup>3</sup>	95% UCL-N	
	1,2-DICHLOROETHANE	ppbv	0.048	0.077	0.08	0.077	ppbv	0.31	ug/m <sup>3</sup>	95% UCL-N	
	1,4-DICHLOROBENZENE	ppbv	0.048	0.070	0.065	0.065	ppbv	0.39	ug/m <sup>3</sup>	Max	
	ACETONE	ppbv	160.6	677	490	490	ppbv	1164	ug/m <sup>3</sup>	Max	
	BENZENE	ppbv	0.472	0.60	0.68	0.60	ppbv	1.92	ug/m <sup>3</sup>	95% UCL-N	
	CARBON TETRACHLORIDE	ppbv	0.081	0.082	0.083	0.082	ppbv	0.52	ug/m <sup>3</sup>	95% UCL-N	
	CHLOROFORM	ppbv	0.089	0.13	0.14	0.13	ppbv	0.63	ug/m <sup>3</sup>	95% UCL-N	
	DICHLORODIFLUOROMETHANE	ppbv	0.61	0.67	0.68	0.67	ppbv	3.31	ug/m <sup>3</sup>	95% UCL-N	
	ETHYLBENZENE	ppbv	0.28	0.42	0.47	0.42	ppbv	1.82	ug/m <sup>3</sup>	95% UCL-G assumed	
	METHYLENE CHLORIDE	ppbv	0.93	1.55	1.7	1.55	ppbv	5.38	ug/m <sup>3</sup>	95% UCL-N	
	TETRACHLOROETHENE	ppbv	0.091	0.25	0.24	0.24	ppbv	1.63	ug/m <sup>3</sup>	Max	
	TOLUENE	ppbv	43.28	286	150	150	ppbv	565	ug/m <sup>3</sup>	Max	
	TRICHLOROFLUOROMETHANE (FREON 11)	ppbv	0.40	0.53	0.57	0.53	ppbv	2.98	ug/m <sup>3</sup>	95% UCL-N	

Statistics: Maximum Detected Value (Max); 95% UCL of Normal Data (95% UCL-N); 95% UCL of Log-transformed Data (95% UCL-T); Non-parametric (UCL-NP); 95% UCL assuming Gamma distribution (95% G-UCL).

(1) The arithmetic mean and the 95UCL were calculated including half the detection limit for the non-detects. As a result, in some cases these values are above the maximum detected.

(2) Values converted using an online units calculator: <http://www.airtoxics.com/cclasses/unitcalc.html>.

(3) The Shapiro-Wilk test was used to test the normality/ lognormality of all data sets at the 0.05 significance level. The UCL procedures listed were selected based on the recommendations of the ProUCL statistical program and based on the results of the W Test, the number of samples, and the standard deviation of the log-transformed data.

ug/m<sup>3</sup>: microgram per cubic meter.

ppbv: parts per billion by volume

TABLE A3-3.4 - Parcel South - Skateland  
MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY  
Omega Chemical Site - Whittier, California

Scenario Timeframe:	Current/Future
Medium:	Soil Gas
Exposure Medium:	Indoor Air

Exposure Point	Chemical of Potential Concern	Units	Arithmetic Mean <sup>(1)</sup>	95% UCL of Distribution <sup>(1)</sup>	Maximum Detected Concentration	Exposure Point Concentrations					
						Soil Gas Value	Units	Indoor Air Value <sup>(2)</sup>	Units	Statistic <sup>(3)</sup>	Rationale
Indoor Air	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	ppbv	80,204	1,014,061	330,000	330,000	ppbv	6.4E+02	ug/m <sup>3</sup>	Max	UCL is greater than Max
	1,1-DICHLOROETHENE	ppbv	46,487	562,808	210,000	210,000	ppbv	2.4E+02	ug/m <sup>3</sup>	Max	UCL is greater than Max
	1,2,4-TRIMETHYLBENZENE	ppbv	194	2,284	3	3	ppbv	3.1E-03	ug/m <sup>3</sup>	Max	UCL is greater than Max
	2,2,4-TRIMETHYLPENTANE	ppbv	72	726	12	12	ppbv	NA	ug/m <sup>3</sup>	Max	UCL is greater than Max
	2-BUTANONE	ppbv	68	1,069	2.6	3	ppbv	2.1E-03	ug/m <sup>3</sup>	Max	UCL is greater than Max
	4-ETHYLTOLUENE	ppbv	68	1,073	2.4	2	ppbv	NA	ug/m <sup>3</sup>	Max	UCL is greater than Max
	ACETONE	ppbv	306	1,286	78	78	ppbv	6.8E-02	ug/m <sup>3</sup>	Max	UCL is greater than Max
	CARBON DISULFIDE	ppbv	69	1,050	3.6	4	ppbv	3.5E-03	ug/m <sup>3</sup>	Max	UCL is greater than Max
	CHLOROFORM	ppbv	194	2,303	2.5	3	ppbv	3.9E-03	ug/m <sup>3</sup>	Max	UCL is greater than Max
	DICHLORODIFLUOROMETHANE	ppbv	415	5,338	1,900	1,900	ppbv	2.1E+00	ug/m <sup>3</sup>	Max	UCL is greater than Max
	HEXANE (N-HEXANE)	ppbv	69	1,027	3	3	ppbv	5.1E-03	ug/m <sup>3</sup>	Max	UCL is greater than Max
	TETRACHLOROETHENE	ppbv	3,250	11,592	13,000	11,592	ppbv	1.9E+01	ug/m <sup>3</sup>	95% UCL-G	
	TRICHLOROETHENE	ppbv	2,538	18,355	7,800	7,800	ppbv	1.1E+01	ug/m <sup>3</sup>	Max	UCL is greater than Max
	TRICHLOROFUOROMETHANE (FREON 11)	ppbv	22,773	252,608	94,000	94,000	ppbv	1.5E+02	ug/m <sup>3</sup>	Max	UCL is greater than Max

Statistics: Maximum Detected Value (Max); 95% UCL of Normal Data (95% UCL-N); 95% UCL of Log-transformed Data (95% UCL-T); Non-parametric (UCL-NP); 95% UCL assuming Gamma distribution (95% G-UCL).

(1) The arithmetic mean and the 95UCL were calculated including half the detection limit for the non-detects. As a result, in some cases these values are above the maximum detected.

(2) Soil gas values modeled to provide indoor air concentrations using EPA Advance Soil Gas Model using Johnson and Ettinger algorithms.

(3) The Shapiro-Wilk test was used to test the normality/ lognormality of all data sets at the 0.05 significance level. The UCL procedures listed were selected based on the recommendations of the ProUCL statistical program and based on the results of the W Test, the number of samples, and the standard deviation of the log-transformed data.

ug/m<sup>3</sup>: microgram per cubic meter.

ppbv: parts per billion by volume

NA: Not available. Indoor air concentration could not be calculated because physical parameters for constituent were not available.

Table A3-4.1  
VALUES USED FOR DAILY INTAKE CALCULATIONS  
Omega Chemical Site - Whittier, California

Scenario Timeframe:	Current/Future
Medium:	Soil
Exposure Medium:	Soil (& Particulates and Vapors from Soil)

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	RME Value	Units	RME Rationale/ Reference	Intake Equation/ Model Name			
Ingestion	Industrial Worker CTE	Adult	Surface Soil	CS	Chemical Concentration in Soil	See Table B-3.1	mg/kg	See Table B-3.1	Chronic Daily Intake (CDI) (mg/kg-day) = CS x CF1 x IR-S x EF x ED x 1/BW x 1/AT			
				CF1	Conversion Factor 1	1E-06	kg/mg	--				
				IR-S	Ingestion Rate of Soil	50	mg/day	EPA 2002a (1)				
				EF	Exposure Frequency	250	days/year	EPA 1991b, 2002a				
				ED	Exposure Duration	25	years	EPA 1991b, 2002a				
				BW	Body Weight	70	kg	EPA 1991b, 2002a				
				AT-C	Averaging Time (Cancer)	25,550	days	EPA 2004a				
				AT-N	Averaging Time (Noncancer)	9,125	days	EPA 2004a				
				Intake factor, cancer [kg-soil/(kg-bw*d)]						1.7E-07	Intake*CS=CDI	
				Intake factor, noncancer [kg-soil/(kg-bw*d)]						4.9E-07	Intake*CS=CDI	
Industrial Worker RME	Adult	Surface Soil	CS	Chemical Concentration in Soil	See Table B-3.1	mg/kg	See Table B-3.1	Chronic Daily Intake (CDI) (mg/kg-day) = CS x CF1 x IR-S x EF x ED x 1/BW x 1/AT				
			CF1	Conversion Factor 1	1E-06	kg/mg	--					
			IR-S	Ingestion Rate of Soil	100	mg/day	EPA 2002a (1)					
			EF	Exposure Frequency	250	days/year	EPA 1991b, 2002a					
			ED	Exposure Duration	25	years	EPA 1991b, 2002a					
			BW	Body Weight	70	kg	EPA 1991b, 2002a					
			AT-C	Averaging Time (Cancer)	25,550	days	EPA 2004a					
			AT-N	Averaging Time (Noncancer)	9,125	days	EPA 2004a					
			Intake factor, cancer [kg-soil/(kg-bw*d)]						3.5E-07	Intake*CS=CDI		
			Intake factor, noncancer [kg-soil/(kg-bw*d)]						9.8E-07	Intake*CS=CDI		
Construction Worker CTE	Adult	Surface and Subsurface Soil	CS	Chemical Concentration in Soil	See Table B-3.2	mg/kg	See Table B-3.2	Chronic Daily Intake (CDI) (mg/kg-day) = CS x CF1 x IR-S x EF x ED x 1/BW x 1/AT				
			CF1	Conversion Factor 1	1E-06	kg/mg	--					
			IR-S	Ingestion Rate of Soil	100	mg/day	EPA 2002a					
			EF	Exposure Frequency	60	days/year	professional judgment (5)					
			ED	Exposure Duration	1	years	EPA 1991b, 2002a					
			BW	Body Weight	70	kg	EPA 1991b, 2002a					
			AT-C	Averaging Time (Cancer)	25,550	days	EPA 2004a					
			AT-N	Averaging Time (Noncancer)	365	days	EPA 2004a					
			Intake factor, cancer [kg-soil/(kg-bw*d)]						3.4E-09	Intake*CS=CDI		
			Intake factor, noncancer [kg-soil/(kg-bw*d)]						2.3E-07	Intake*CS=CDI		
Construction Worker RME	Adult	Surface and Subsurface Soil	CS	Chemical Concentration in Soil	See Table B-3.2	mg/kg	See Table B-3.2	Chronic Daily Intake (CDI) (mg/kg-day) = CS x CF1 x IR-S x EF x ED x 1/BW x 1/AT				
			CF1	Conversion Factor 1	1E-06	kg/mg	--					
			IR-S	Ingestion Rate of Soil	480	mg/day	EPA 2002a					
			EF	Exposure Frequency	60	days/year	professional judgment (5)					
			ED	Exposure Duration	1	years	EPA 1991b, 2002a					
			BW	Body Weight	70	kg	EPA 1991b, 2002a					
			AT-C	Averaging Time (Cancer)	25,550	days	EPA 2004a					
			AT-N	Averaging Time (Noncancer)	365	days	EPA 2004a					
			Intake factor, cancer [kg-soil/(kg-bw*d)]						1.6E-08	Intake*CS=CDI		
			Intake factor, noncancer [kg-soil/(kg-bw*d)]						1.1E-06	Intake*CS=CDI		

Table A3-4.1  
VALUES USED FOR DAILY INTAKE CALCULATIONS  
Omega Chemical Site - Whittier, California

Scenario Timeframe:	Current/Future
Medium:	Soil
Exposure Medium:	Soil (& Particulates and Vapors from Soil)

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	RME Value	Units	RME Rationale/ Reference	Intake Equation/ Model Name				
Dermal	Industrial Worker	Adult	Surface Soil	CS	Chemical Concentration in Soil	See Table B-3.1	mg/kg	See Table B-3.1	CDI (mg/kg-day) = CS x CF1 x SA x AF x ABS x EF x ED x 1/BW x 1/AT				
				CF1	Conversion Factor 1	1E-06	kg/mg	--					
				SA	Skin Surface Area Available for Contact	3,300	cm <sup>2</sup>	EPA 2002a (6)					
				AF	Adherence Factor	0.2	mg/cm <sup>2</sup>	EPA 2002a					
				ABS	Absorption Factor	Chemical Specific, See Tables 5.1 and 6.1	unitless	EPA 2004a					
				EF	Exposure Frequency	250	days/year	EPA 1991b, 2002a					
				ED	Exposure Duration	25	years	EPA 1991b, 2002a					
				BW	Body Weight	70	kg	EPA 1991b, 2002a					
				AT-C	Averaging Time (Cancer)	25,550	days	EPA 2004a					
				AT-N	Averaging Time (Noncancer)	9,125	days	EPA 2004a					
				Intake factor, cancer [kg-soil/(kg-bw*d)]						2.31E-06	Intake*CS*ABS=CDI		
				Intake factor, noncancer [kg-soil/(kg-bw*d)]						6.46E-06	Intake*CS*ABS=CDI		
				Construction Worker	Adult	Surface and Subsurface Soil	CS	Chemical Concentration in Soil		See Table B-3.2	mg/kg	See Table B-3.2	CDI (mg/kg-day) = CS x CF1 x SA x AF x ABS x EF x ED x 1/BW x 1/AT
							CF1	Conversion Factor 1		1E-06	kg/mg	--	
SA	Skin Surface Area Available for Contact	3,300	cm <sup>2</sup>				EPA 2002a (6)						
AF	Adherence Factor	0.37	mg/cm <sup>2</sup>				EPA 2004a						
ABS	Absorption Factor	Chemical Specific, See Tables 5.1 and 6.1	unitless				EPA 2004a						
EF	Exposure Frequency	60	days/year				professional judgment (5)						
ED	Exposure Duration	1	years				EPA 1991b, 2002a						
BW	Body Weight	70	kg				EPA 1991b, 2002a						
AT-C	Averaging Time (Cancer)	25,550	days				EPA 2004a						
AT-N	Averaging Time (Noncancer)	365	days				EPA 2004a						
Intake factor, cancer [kg-soil/(kg-bw*d)]							4.10E-08	Intake*CS*ABS=CDI					
Intake factor, noncancer [kg-soil/(kg-bw*d)]							2.87E-06	Intake*CS*ABS=CDI					
Inhalation	Construction Worker CTE	Adult	Surface and Subsurface Soil as Fugitive Dust				CS	Chemical Concentration in Soil	See Table B-3.2	mg/kg	See Table B-3.2	Chronic Daily Intake (CDI) (mg/kg-day) = CS x IR-A x ET x EF x ED x 1/PEF x 1/BW x 1/AT	
							IR-A	Inhalation Rate of Air	2.5	m <sup>3</sup> /hr	EPA 1991b, 2002		
				ET	Exposure Time	10	hrs/day	professional judgment (5)					
				EF	Exposure Frequency	60	days/year	professional judgment (5)					
				ED	Exposure Duration	1	years	EPA 1991b, 2002					
				PEF	Particulate Emission Factor	1.36E+09	m <sup>3</sup> /kg	EPA 2002					
				BW	Body Weight	70	kg	EPA 1991b, 2002					
				AT-C	Averaging Time (Cancer)	25,550	days	EPA 2004a					
				AT-N	Averaging Time (Noncancer)	365	days	EPA 2004a					
				Intake factor, cancer [kg-soil/(kg-bw*d)]						6.2E-13	Intake*CS=CDI		
				Intake factor, noncancer [kg-soil/(kg-bw*d)]						4.3E-11	Intake*CS=CDI		

Table A3-4.1  
VALUES USED FOR DAILY INTAKE CALCULATIONS  
Omega Chemical Site - Whittier, California

Scenario Timeframe:	Current/Future
Medium:	Soil
Exposure Medium:	Soil (& Particulates and Vapors from Soil)

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	RME Value	Units	RME Rationale/ Reference	Intake Equation/ Model Name				
Inhalation	Construction Worker RME	Adult	Surface and Subsurface Soil as Fugitive Dust	CS	Chemical Concentration in Soil	See Table B-3.2	mg/kg	See Table B-3.2	Chronic Daily Intake (CDI) (mg/kg-day) = CS x IR-A x ET x EF x ED x 1/PEF x  1/BW x 1/AT				
				IR-A	Inhalation Rate of Air	4.8	m <sup>3</sup> /hr	EPA 1991b, 2002					
				ET	Exposure Time	10	hrs/day	professional judgment (5)					
				EF	Exposure Frequency	60	days/year	professional judgment (5)					
				ED	Exposure Duration	1	years	EPA 1991b, 2002					
				PEF	Particulate Emission Factor	1.36E+09	m <sup>3</sup> /kg	EPA 2002					
				BW	Body Weight	70	kg	EPA 1991b, 2002					
				AT-C	Averaging Time (Cancer)	25,550	days	EPA 2004a					
				AT-N	Averaging Time (Noncancer)	365	days	EPA 2004a					
				Intake factor, cancer [kg-soil/(kg-bw*d)]						1.2E-12		Intake*CS=CDI	
Intake factor, noncancer [kg-soil/(kg-bw*d)]						8.3E-11		Intake*CS=CDI					
Industrial Worker CTE	Adult	Adult	Soil Gas Migration to Indoor Air	C <sub>building</sub>	Chemical Concentration in Indoor Air	See Tables B-3.3 and B-3.4	mg/m <sup>3</sup>	See Tables B-3.3 and B-3.4	Chronic Daily Intake (CDI) (mg/kg-day) = C <sub>building</sub> x IR-A x ET x EF x ED x 1/BW x 1/AT				
				IR-A	Inhalation Rate of Air	0.83	m <sup>3</sup> /hr	EPA 2002a					
				ET	Exposure Time	8	hrs/day	professional judgment (5)					
				EF	Exposure Frequency	250	days/year	EPA 1991b, 2002a					
				ED	Exposure Duration	25	years	EPA 1991b, 2002a					
				BW	Body Weight	70	kg	EPA 1991b, 2002a					
				AT-C	Averaging Time (Cancer)	25,550	days	EPA 2004a					
				AT-N	Averaging Time (Noncancer)	9,125	days	EPA 2004a					
				Intake factor, cancer [m <sup>3</sup> /(kg-bw*d)]						2.3E-02		Intake*CS=CDI	
				Intake factor, noncancer [m <sup>3</sup> /(kg-bw*d)]						6.5E-02		Intake*CS=CDI	
Industrial Worker RME	Adult	Adult	Soil Gas Migration to Indoor Air	C <sub>building</sub>	Chemical Concentration in Indoor Air	See Tables B-3.3 and B-3.4	mg/m <sup>3</sup>	See Tables B-3.3 and B-3.4	Chronic Daily Intake (CDI) (mg/kg-day) = C <sub>building</sub> x IR-A x ET x EF x ED x 1/BW x 1/AT				
				IR-A	Inhalation Rate of Air	1.2	m <sup>3</sup> /hr	EPA 2002a					
				ET	Exposure Time	8	hrs/day	professional judgment (5)					
				EF	Exposure Frequency	250	days/year	EPA 1991b, 2002a					
				ED	Exposure Duration	25	years	EPA 1991b, 2002a					
				BW	Body Weight	70	kg	EPA 1991b, 2002a					
				AT-C	Averaging Time (Cancer)	25,550	days	EPA 2004a					
				AT-N	Averaging Time (Noncancer)	9,125	days	EPA 2004a					
				Intake factor, cancer [m <sup>3</sup> /(kg-bw*d)]						3.4E-02		Intake*CS=CDI	
				Intake factor, noncancer [m <sup>3</sup> /(kg-bw*d)]						9.4E-02		Intake*CS=CDI	

(1) Outdoor worker exposure parameter was conservatively applied to this receptor.

(2) Residential exposure parameter was conservatively applied to this receptor.

(3) Assumes 3 days/week in the spring and fall and 5 days/week in the summer, with 13 weeks per season.

(4) Based on number of years in the age group for adolescents (ages 12 to 18 years).

(5) Assumes mowing lawn 1 day/week, May through October.

(6) Based on 50th percentile values for men and women (EPA 1997a) for the following body parts: head, hands, and forearms.

(7) Based on 50th percentile total body surface area for 12 to 18 year olds (EPA 1997a, p6-15) and mean percentage for the following body parts: head, hands, forearms, and lower legs (EPA 1997a, p. 6-16).

(8) AF was selected based on adolescent in dry soil for 95% percentile value.

\* Utility worker assumptions were conservatively selected as equal to construction worker exposure assumptions unless noted as being based upon "professional judgment."

Sources:

EPA 1989: Risk Assessment Guidance for Superfund. Vol. 1: Human Health Evaluation Manual, Part A. OERR. EPA/540/1-89/002.

EPA 1991b: Risk Assessment Guidance for Superfund. Vol. 1: Human Health Evaluation Manual, Supplemental Guidance, Standard Default Exposure Factors. Interim Final. OSWER Directive 9285.6-03.

EPA 1997a: Exposure Factors Handbook. Vol. 1: General Factors. ORD. EPA/600/P-95/002Fa.

EPA 2002a: Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites. OSWER 9355.4-24.

EPA 2004a: Risk Assessment Guidance for Superfund. Vol. 1: Human Health Evaluation Manual, Part E, Supplemental Guidance for Dermal Risk Assessment. EPA/540/R/99/005.

cm<sup>2</sup>: square centimeter.

kg/mg: kilogram per milligram.

kg: kilogram.

L/day: liter per day.

L/m<sup>3</sup>: liters per cubic meters.

m<sup>3</sup>/kg: cubic meter per kilogram.

mg/day: milligram per day.

mg/kg: milligram per kilogram.

mg/ug: milligram per microgram.

ug/L: microgram per liter.

RME: reasonable maximum exposure

CTE: central tendency exposure

Table A3-4.2  
VALUES USED FOR DAILY INTAKE CALCULATIONS  
Omega Chemical Site - Whittier, California

Scenario Timeframe:	Current/Future
Medium:	Groundwater
Exposure Medium:	Groundwater

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	RME Value	Units	RME Rationale/ Reference	Intake Equation/ Model Name	
Inhalation	Industrial Worker CTE	Adult	Groundwater Migration to Indoor Air	C <sub>building</sub>	Chemical Concentration in Indoor Air	See Table B-3.5	mg/m <sup>3</sup>	See Table B-3.5		
				IR-A	Inhalation Rate of Groundwater Vapor	0.83	m <sup>3</sup> /hr	EPA 2002a		
				ET	Exposure Time	8	hr			
				EF	Exposure Frequency	250	days/year	EPA 1991b, 2002a		
				ED	Exposure Duration	25	years	EPA 1991b, 2002a		
				BW	Body Weight	70	kg	EPA 1991b, 2002a		
				AT-C	Averaging Time (Cancer)	25,550	days	EPA 2004a		
	AT-N	Averaging Time (Noncancer)	9,125	days	EPA 2004a					
	Intake Factor - Cancer						2.3E-02			
	Intake Factor - Noncancer						6.5E-02			
	Industrial Worker RME	Adult	Groundwater Migration to Indoor Air	C <sub>building</sub>	Chemical Concentration in Indoor Air	See Table B-3.5	mg/m <sup>3</sup>	See Table B-3.5		
				IR-A	Inhalation Rate of Groundwater Vapor	1.2	m <sup>3</sup> /hr	EPA 2002a		
				ET	Exposure Time	8	hr			
				EF	Exposure Frequency	250	days/year	EPA 1991b, 2002a		
ED				Exposure Duration	25	years	EPA 1991b, 2002a			
BW				Body Weight	70	kg	EPA 1991b, 2002a			
AT-C				Averaging Time (Cancer)	25,550	days	EPA 2004a			
AT-N	Averaging Time (Noncancer)	9,125	days	EPA 2004a						
Intake Factor - Cancer						3.4E-02				
Intake Factor - Noncancer						9.4E-02				

RME = Reasonable Maximum Exposure.

Sources:

EPA 1989: Risk Assessment Guidance for Superfund. Vol. 1: Human Health Evaluation Manual, Part A. OERR. EPA/540/1-89/002.

EPA 1991: Risk Assessment Guidance for Superfund. Vol. 1: Human Health Evaluation Manual, Supplemental Guidance, Standard Default Exposure Factors. Interim Final. OSWER Directive 9285.6-03.

EPA 1997a: Exposure Factors Handbook. Vol. 1: General Factors. ORD. EPA/600/P-95/002Fa.

EPA 2004a: Risk Assessment Guidance for Superfund. Vol. 1: Human Health Evaluation Manual, Part E, Supplemental Guidance for Dermal Risk Assessment. EPA/540/R/99/005.

EPA 2004b: EPA Region 9 user's Guide and Background Technical Document for USEPA Region 9's Preliminary Remediation Goals (PRG) Table. Obtained online at:

<http://www.epa.gov/region09/waste/sfund/prg/index.htm>

See Appendix C, Tables 4.1, 4.2 and 4.3 for details.

kg: kilogram

hr: hour

mg/m<sup>3</sup> : milligrams per cubic meter

m<sup>3</sup>/hour: cubic meter per hour

TABLE A3-5.1  
NON-CANCER TOXICITY DATA - ORAL/DERMAL  
Omega Chemical Site - Whittier, California

Chemical of Potential Concern	Chronic/ Subchronic	Oral RfD		Oral Absorption Efficiency for Dermal (1)	Absorbed RfD for Dermal		Primary Target Organ(s)	Combined Uncertainty/Modifying Factors	RfD:Target Organ(s)	
		Value	Units		Value	Units			Source(s)	Date(s) (MM/DD/YYYY)
1,1,1-TRICHLOROETHANE	chronic	2.8E-01	mg/kg/day	10%	2.8E+00	mg/kg/day			EPA-Region 9	10/01/2004
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	chronic	3.0E-01	mg/kg/day	10%	3.0E+00	mg/kg/day			IRIS	11/30/2006
1,1-DICHLOROETHENE	chronic	5.0E-02	mg/kg/day	10%	5.0E-01	mg/kg/day	CNS Liver toxicity	10 100	IRIS	11/30/2006
1,2,4-TRIMETHYLBENZENE	chronic	5.0E-02	mg/kg/day	10%	5.0E-01	mg/kg/day			EPA-Region 9	10/01/2004
1,2-DICHLOROETHANE	chronic	2.0E-02	mg/kg/day	10%	2.0E-01	mg/kg/day			EPA-Region 9	10/01/2004
1,4-DICHLOROBENZENE	chronic	3.0E-02	mg/kg/day	10%	3.0E-01	mg/kg/day			EPA-Region 9	10/01/2004
1,4-DIOXANE	chronic	NA	mg/kg/day	3%	NA	mg/kg/day				11/30/2006
2,2,4-TRIMETHYLPENTANE	chronic	NA	mg/kg/day	10%	NA	mg/kg/day				11/30/2006
2-BUTANONE	chronic	6.0E-01	mg/kg/day	10%	6.0E+00	mg/kg/day	Dec. offspring weight	1,000	IRIS	11/30/2006
2-METHYLNAPHTHALENE	chronic	4.0E-03	mg/kg/day	10%	4.0E-02	mg/kg/day	Pulmonary alveolar proteinosis	1,000	IRIS	11/30/2006
4-ETHYLTOLUENE	chronic	NA	mg/kg/day	10%	NA	mg/kg/day				11/30/2006
ACETONE	chronic	9.0E-01	mg/kg/day	10%	9.0E+00	mg/kg/day	Kidney	1,000	IRIS	11/30/2006
BENZENE	chronic	4.0E-03	mg/kg/day	10%	4.0E-02	mg/kg/day	Dec. lymphocyte count	300	IRIS	11/30/2006
BENZO(A)ANTHRACENE	chronic	NA	mg/kg/day	15%	NA	mg/kg/day				11/30/2006
BENZO(A)PYRENE	chronic	NA	mg/kg/day	15%	NA	mg/kg/day				11/30/2006
BENZO(B)FLUORANTHENE	chronic	NA	mg/kg/day	15%	NA	mg/kg/day				11/30/2006
BIS(2-ETHYLHEXYL)PHTHALATE	chronic	2.0E-02	mg/kg/day	10%	2.0E-01	mg/kg/day	Inc. liver weight	1,000	IRIS	11/30/2006
CARBON DISULFIDE	chronic	1.0E-01	mg/kg/day	10%	1.0E+00	mg/kg/day	Fetal toxicity	100	IRIS	11/30/2006
CARBON TETRACHLORIDE	chronic	7.0E-04	mg/kg/day	10%	7.0E-03	mg/kg/day	Liver lesions	1,000	IRIS	11/30/2006
CHLOROFORM	chronic	1.0E-02	mg/kg/day	10%	1.0E-01	mg/kg/day	Liver	100	IRIS	11/30/2006
CHROMIUM	chronic	1.5E+00	mg/kg/day	1%	1.5E+02	mg/kg/day	None	100	IRIS	11/30/2006
CHROMIUM VI	chronic	3.0E-03	mg/kg/day		NA	mg/kg/day	None	300	IRIS	11/30/2006
DICHLORODIFLUOROMETHANE	chronic	2.0E-01	mg/kg/day	10%	2.0E+00	mg/kg/day	Dec. body weight	100	IRIS	11/30/2006
DIELDRIN	chronic	5.0E-05	mg/kg/day	5%	1.0E-03	mg/kg/day	Liver	100	IRIS	11/30/2006
ETHYLBENZENE	chronic	1.0E-01	mg/kg/day	10%	1.0E+00	mg/kg/day	Liver and kidney toxicity	1,000	IRIS	11/30/2006
HEXANE (N-HEXANE)	chronic	1.1E+01	mg/kg/day	10%	1.1E+02	mg/kg/day			EPA-Region 9	10/01/2004
IRON	chronic	3.0E-01	mg/kg/day	1%	3.0E+01	mg/kg/day			EPA-Region 9	10/01/2004
LEAD	chronic	NA	mg/kg/day	1%	NA	mg/kg/day				11/30/2006
METHYLENE CHLORIDE	chronic	6.0E-02	mg/kg/day	10%	6.0E-01	mg/kg/day			IRIS	11/30/2006
NAPHTHALENE	chronic	2.0E-02	mg/kg/day	15%	1.3E-01	mg/kg/day	Dec. body weight in males	3,000	IRIS	11/30/2006
PCB-1254 (AROCOR 1254)	chronic	2.0E-05	mg/kg/day	15%	1.3E-04	mg/kg/day	Ocular exudate	300	IRIS	11/30/2006
PHENANTHRENE	chronic	NA	mg/kg/day	15%	NA	mg/kg/day				11/30/2006
TETRACHLOROETHENE	chronic	1.0E-02	mg/kg/day	10%	1.0E-01	mg/kg/day	Liver toxicity in mice	1,000	IRIS	11/30/2006
TETRAHYDROFURAN	chronic	2.1E-01	mg/kg/day	10%	2.1E+00	mg/kg/day			EPA-Region 9	10/01/2004
TOLUENE	chronic	8.0E-02	mg/kg/day	10%	8.0E-01	mg/kg/day	Inc. kidney weight	3,000	IRIS	11/30/2006
TRICHLOROETHENE	chronic	3.0E-04	mg/kg/day	10%	3.0E-03	mg/kg/day			EPA-Region 9	10/01/2004
TRICHLOROFLUOROMETHANE (FREON 11)	chronic	3.0E-01	mg/kg/day	10%	3.0E+00	mg/kg/day	Survival and histopathology	1,000	IRIS	11/30/2006

Footnotes:

(1) Oral Absorption Efficiency for Dermal contact was based on DTSC PEA Guidance Appendix A Table 2 values for absorption fractions (DTSC 1999).

EPA-NCEA: USEPA Region III Provisional Peer Reviewed Toxicity Values for Superfund (PPRTV) (EPA 2005b).

HEAST: Health Effects Assessments Summary Tables (EPA 1997b).

IRIS: Integrated Risk Information System (EPA 2005a).

na: Chemical is listed, no value is available.

ni: No information available.

nl: Chemical is not listed.

CNS: Central Nervous System.

mg/kg/day: milligram per kilogram per day.

TABLE A3-5.2  
NON-CANCER TOXICITY DATA - INHALATION  
Omega Chemical Site - Whittier, California

Chemical of Potential Concern	Chronic/ Subchronic	Inhalation RfC		Inhalation RfD		Primary Target Organ(s)	Combined Uncertainty/Modifying Factors	RfC : Target Organ(s)	
		Value	Units	Value	Units			Source(s)	Date(s) (MM/DD/YYYY)
1,1,1-TRICHLOROETHANE	chronic	2.2E+00	mg/m <sup>3</sup>	6.3E-01	mg/kg/day			EPA-Region 9	10/01/2004
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	chronic	NA	mg/m <sup>3</sup>	NA	mg/kg/day			IRIS	11/30/2006
1,1-DICHLOROETHENE	chronic	2.0E-01	mg/m <sup>3</sup>	5.7E-02	mg/kg/day	Liver toxicity	30	IRIS	11/30/2006
1,2,4-TRIMETHYLBENZENE	chronic	6.0E-03	mg/m <sup>3</sup>	1.7E-03	mg/kg/day			EPA-Region 9	10/01/2004
1,2-DICHLOROETHANE	chronic	4.9E-03	mg/m <sup>3</sup>	1.4E-03	mg/kg/day			EPA-Region 9	10/01/2004
1,4-DICHLOROBENZENE	chronic	8.0E-01	mg/m <sup>3</sup>	2.3E-01	mg/kg/day	CNS, RESP, liver, kidney	100	OEHHA	11/30/2006
1,4-DIOXANE	chronic	3.0E+00	mg/m <sup>3</sup>	8.6E-01	mg/kg/day	ALIM, Kidney, CVS		OEHHA	11/30/2006
2,2,4-TRIMETHYLPENTANE	chronic	NA	mg/m <sup>3</sup>	NA	mg/kg/day				11/30/2006
2-BUTANONE	chronic	5.0E+00	mg/m <sup>3</sup>	1.4E+00	mg/kg/day	DEV	300	IRIS	11/30/2006
2-METHYLNAPHTHALENE	chronic	NA	mg/m <sup>3</sup>	NA	mg/kg/day				11/30/2006
4-ETHYLTOLUENE	chronic	NA	mg/m <sup>3</sup>	NA	mg/kg/day				11/30/2006
ACETONE	chronic	3.2E+00	mg/m <sup>3</sup>	9.0E-01	mg/kg/day			EPA-Region 9	10/01/2004
BENZENE	chronic	3.0E-02	mg/m <sup>3</sup>	8.6E-03	mg/kg/day	Hematopoetic system, DEV, CNS,	300	IRIS	11/30/2006
BENZO(A)ANTHRACENE	chronic	NA	mg/m <sup>3</sup>	NA	mg/kg/day				11/30/2006
BENZO(A)PYRENE	chronic	NA	mg/m <sup>3</sup>	NA	mg/kg/day				11/30/2006
BENZO(B)FLUORANTHENE	chronic	NA	mg/m <sup>3</sup>	NA	mg/kg/day				11/30/2006
BIS(2-ETHYLHEXYL)PHTHALATE	chronic	7.0E-02	mg/m <sup>3</sup>	2.0E-02	mg/kg/day			EPA-Region 9	10/01/2004
CARBON DISULFIDE	chronic	7.0E-01	mg/m <sup>3</sup>	2.0E-01	mg/kg/day	Peripheral nervous system	30	IRIS	11/30/2006
CARBON TETRACHLORIDE	chronic	4.0E-02	mg/m <sup>3</sup>	1.1E-02	mg/kg/day	ALIM, DEV, CNS		OEHHA	11/30/2006
CHLOROFORM	chronic	3.0E-01	mg/m <sup>3</sup>	8.6E-02	mg/kg/day	ALIM, Kidney, DEV		OEHHA	11/30/2006
CHROMIUM	chronic	NA	mg/m <sup>3</sup>	NA	mg/kg/day				11/30/2006
CHROMIUM VI	chronic	8.0E-06	mg/m <sup>3</sup>	2.3E-06	mg/kg/day	RESP	90	IRIS	11/30/2006
DICHLORODIFLUOROMETHANE	chronic	2.0E-01	mg/m <sup>3</sup>	5.7E-02	mg/kg/day			EPA-Region 9	10/01/2004
DIENDRIN	chronic	1.8E-04	mg/m <sup>3</sup>	5.0E-05	mg/kg/day			EPA-Region 9	10/01/2004
ETHYLBENZENE	chronic	1.0E+00	mg/m <sup>3</sup>	2.9E-01	mg/kg/day	DEV, ALIM, liver, kidney, endocrine	300	IRIS	11/30/2006
HEXANE (N-HEXANE)	chronic	7.0E-01	mg/m <sup>3</sup>	2.0E-01	mg/kg/day	Peripheral neuropathy	300	IRIS	11/30/2006
IRON	chronic	NA	mg/m <sup>3</sup>	NA	mg/kg/day				11/30/2006
LEAD	chronic	NA	mg/m <sup>3</sup>	NA	mg/kg/day				11/30/2006
METHYLENE CHLORIDE	chronic	4.0E-01	mg/m <sup>3</sup>	1.1E-01	mg/kg/day	CVS, CNS		OEHHA	11/30/2006
NAPHTHALENE	chronic	3.0E-03	mg/m <sup>3</sup>	8.5E-04	mg/kg/day	RESP	3000	IRIS	11/30/2006
PCB-1254 (AROCOR 1254)	chronic	7.0E-05	mg/m <sup>3</sup>	2.0E-05	mg/kg/day			EPA-Region 9	10/01/2004
PHENANTHRENE	chronic	NA	mg/m <sup>3</sup>	NA	mg/kg/day				11/30/2006
TETRACHLOROETHENE	chronic	3.5E-02	mg/m <sup>3</sup>	1.0E-02	mg/kg/day			EPA-Region 9	10/01/2004
TETRAHYDROFURAN	chronic	3.0E-01	mg/m <sup>3</sup>	8.6E-02	mg/kg/day			EPA-Region 9	10/01/2004
TOLUENE	chronic	3.0E-01	mg/m <sup>3</sup>	8.6E-02	mg/kg/day	CNS, RESP, DEV	10	OEHHA	11/30/2006
TRICHLOROETHENE	chronic	6.0E-01	mg/m <sup>3</sup>	1.7E-01	mg/kg/day	CNS, eyes		OEHHA	11/30/2006
TRICHLOROFLUOROMETHANE (FREON 11)	chronic	7.0E-01	mg/m <sup>3</sup>	2.0E-01	mg/kg/day			EPA-Region 9	10/01/2004

Footnotes:

Cal-EPA: Technical Support Document for Describing Available Cancer Potency Factors (OEHHA 2003).  
EPA-NCEA: USEPA Region III Provisional Peer Reviewed Toxicity Values for Superfund (PPRTV) (EPA 2005b).  
EPA-Region 9: USEPA Region IX PRG Table (EPA 2004c).  
IRIS: Integrated Risk Information System (EPA 2005a).  
na: Chemical is listed, no value is available.  
ni: No information available.  
mg/m<sup>3</sup>: milligram per cubic meter.  
mg/kg/day: milligram per kilogram per day.

CNS: Central Nervous system  
CVS: Cardiovascular system  
RESP: Respiratory system  
ALIM: Alimentary system  
DEV: Developmental

TABLE A3-6.1  
 CANCER TOXICITY DATA - ORAL/DERMAL  
 Omega Chemical Site - Whittier, California

Chemical of Potential Concern	Oral Cancer Slope Factor		Oral Absorption Efficiency for Dermal (1)	Absorbed Cancer Slope Factor for Dermal		Weight of Evidence/ Cancer Guideline Description	Oral Cancer Slope Factor	
	Value	Units		Value	Units		Source(s)	Date(s) (MM/DD/YYYY)
1,1,1-TRICHLOROETHANE	NA	mg/kg/day <sup>-1</sup>	10%	NA	mg/kg/day <sup>-1</sup>	D	OEHHA	11/30/2006
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	NA	mg/kg/day <sup>-1</sup>	10%	NA	mg/kg/day <sup>-1</sup>			11/30/2006
1,1-DICHLOROETHENE	NA	mg/kg/day <sup>-1</sup>	10%	NA	mg/kg/day <sup>-1</sup>	C	IRIS	11/30/2006
1,2,4-TRIMETHYLBENZENE	NA	mg/kg/day <sup>-1</sup>	10%	NA	mg/kg/day <sup>-1</sup>			11/30/2006
1,2-DICHLOROETHANE	9.1E-02	mg/kg/day <sup>-1</sup>	10%	9.1E-03	mg/kg/day <sup>-1</sup>	B2	IRIS	11/30/2006
1,4-DICHLOROBENZENE	5.4E-03	mg/kg/day <sup>-1</sup>	10%	5.4E-04	mg/kg/day <sup>-1</sup>	2B	OEHHA	11/30/2006
1,4-DIOXANE	2.7E-02	mg/kg/day <sup>-1</sup>	3%	8.1E-04	mg/kg/day <sup>-1</sup>	B2	OEHHA	11/30/2006
2,2,4-TRIMETHYLPENTANE	NA	mg/kg/day <sup>-1</sup>	10%	NA	mg/kg/day <sup>-1</sup>			11/30/2006
2-BUTANONE	NA	mg/kg/day <sup>-1</sup>	10%	NA	mg/kg/day <sup>-1</sup>			11/30/2006
2-METHYLNAPHTHALENE	NA	mg/kg/day <sup>-1</sup>	10%	NA	mg/kg/day <sup>-1</sup>			11/30/2006
4-ETHYLTOLUENE	NA	mg/kg/day <sup>-1</sup>	10%	NA	mg/kg/day <sup>-1</sup>			11/30/2006
ACETONE	NA	mg/kg/day <sup>-1</sup>	10%	NA	mg/kg/day <sup>-1</sup>			11/30/2006
BENZENE	1.0E-01	mg/kg/day <sup>-1</sup>	10%	1.0E-02	mg/kg/day <sup>-1</sup>	A	OEHHA	11/30/2006
BENZO(A)ANTHRACENE	1.2E+00	mg/kg/day <sup>-1</sup>	15%	1.8E-01	mg/kg/day <sup>-1</sup>	B2	OEHHA	11/30/2006
BENZO(A)PYRENE	1.2E+01	mg/kg/day <sup>-1</sup>	15%	1.8E+00	mg/kg/day <sup>-1</sup>	B2	OEHHA	11/30/2006
BENZO(B)FLUORANTHENE	1.2E+00	mg/kg/day <sup>-1</sup>	15%	1.8E-01	mg/kg/day <sup>-1</sup>	B2	OEHHA	11/30/2006
BIS(2-ETHYLHEXYL)PHTHALATE	1.4E-02	mg/kg/day <sup>-1</sup>	10%	1.4E-03	mg/kg/day <sup>-1</sup>	B2	IRIS	11/30/2006
CARBON DISULFIDE	NA	mg/kg/day <sup>-1</sup>	10%	NA	mg/kg/day <sup>-1</sup>			11/30/2006
CARBON TETRACHLORIDE	1.5E-01	mg/kg/day <sup>-1</sup>	10%	1.5E-02	mg/kg/day <sup>-1</sup>	B2	OEHHA	11/30/2006
CHLOROFORM	3.1E-02	mg/kg/day <sup>-1</sup>	10%	3.1E-03	mg/kg/day <sup>-1</sup>	B2	OEHHA	11/30/2006
CHROMIUM	NA	mg/kg/day <sup>-1</sup>	1%	NA	mg/kg/day <sup>-1</sup>	D	IRIS	11/30/2006
CHROMIUM VI	NA	mg/kg/day <sup>-1</sup>		NA	mg/kg/day <sup>-1</sup>	A	IRIS	11/30/2006
DICHLORODIFLUOROMETHANE	NA	mg/kg/day <sup>-1</sup>	10%	NA	mg/kg/day <sup>-1</sup>			11/30/2006
DIELDRIN	1.6E+01	mg/kg/day <sup>-1</sup>	5%	8.0E-01	mg/kg/day <sup>-1</sup>	B2	OEHHA	11/30/2006
ETHYLBENZENE	NA	mg/kg/day <sup>-1</sup>	10%	NA	mg/kg/day <sup>-1</sup>	D	IRIS	11/30/2006
HEXANE (N-HEXANE)	NA	mg/kg/day <sup>-1</sup>	10%	NA	mg/kg/day <sup>-1</sup>			11/30/2006
IRON	NA	mg/kg/day <sup>-1</sup>	1%	NA	mg/kg/day <sup>-1</sup>			11/30/2006
LEAD	8.5E-03	mg/kg/day <sup>-1</sup>	1%	8.5E-05	mg/kg/day <sup>-1</sup>	B2	OEHHA	11/30/2006
METHYLENE CHLORIDE	1.4E-02	mg/kg/day <sup>-1</sup>	10%	1.4E-03	mg/kg/day <sup>-1</sup>	B2	OEHHA	11/30/2006
NAPHTHALENE	1.2E-01	mg/kg/day <sup>-1</sup>	15%	1.8E-02	mg/kg/day <sup>-1</sup>	C	EPA-Region 9	10/01/2004
PCB-1254 (AROCLOR 1254)	5.0E+00	mg/kg/day <sup>-1</sup>	15%	7.5E-01	mg/kg/day <sup>-1</sup>	B2	OEHHA	11/30/2006
PHENANTHRENE	NA	mg/kg/day <sup>-1</sup>	15%	NA	mg/kg/day <sup>-1</sup>	D	IRIS	11/30/2006
TETRACHLOROETHENE	5.4E-01	mg/kg/day <sup>-1</sup>	10%	5.4E-02	mg/kg/day <sup>-1</sup>	2B	OEHHA	11/30/2006
TETRAHYDROFURAN	7.6E-03	mg/kg/day <sup>-1</sup>	10%	7.6E-04	mg/kg/day <sup>-1</sup>		EPA-Region 9	10/01/2004
TOLUENE	NA	mg/kg/day <sup>-1</sup>	10%	NA	mg/kg/day <sup>-1</sup>			11/30/2006
TRICHLOROETHENE	1.3E-02	mg/kg/day <sup>-1</sup>	10%	1.3E-03	mg/kg/day <sup>-1</sup>	2A	OEHHA	11/30/2006
TRICHLOROFLUOROMETHANE (FREON 11)	NA	mg/kg/day <sup>-1</sup>	10%	NA	mg/kg/day <sup>-1</sup>			11/30/2006

Footnotes:

(1) Oral Absorption Efficiency for Dermal contact was based on DTSC PEA Guidance Appendix A Table 2 values for absorption fractions (DTSC 1999).

EPA-NCEA: USEPA Region III Provisional Peer Reviewed Toxicity Values for Superfund (PPRTV) (EPA 2005b).

IRIS: Integrated Risk Information System (EPA 2005a).

na: Chemical is listed, no value is available.

ne: Chemical has not been evaluated by EPA for evidence of human carcinogenicity.

ni: No information available.

mg/kg/day<sup>-1</sup>: milligram per kilogram-day.

TABLE A3-6.2  
 CANCER TOXICITY DATA - INHALATION  
 Omega Chemical Site - Whittier, California

Chemical of Potential Concern	Unit Risk		Inhalation Cancer Slope Factor		Weight of Evidence/ Cancer Guideline Description	Unit Risk : Inhalation CSF	
	Value	Units	Value	Units		Source(s)	Date(s) (MM/DD/YYYY)
1,1,1-TRICHLOROETHANE	NA	(ug/m <sup>3</sup> ) <sup>-1</sup>	NA	mg/kg/day <sup>-1</sup>	D	IRIS	11/30/2006
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	NA	(ug/m <sup>3</sup> ) <sup>-1</sup>	NA	mg/kg/day <sup>-1</sup>			11/30/2006
1,1-DICHLOROETHENE	NA	(ug/m <sup>3</sup> ) <sup>-1</sup>	NA	mg/kg/day <sup>-1</sup>	C	IRIS	11/30/2006
1,2,4-TRIMETHYLBENZENE	NA	(ug/m <sup>3</sup> ) <sup>-1</sup>	NA	mg/kg/day <sup>-1</sup>			11/30/2006
1,2-DICHLOROETHANE	2.6E-05	(ug/m <sup>3</sup> ) <sup>-1</sup>	9.1E-02	mg/kg/day <sup>-1</sup>	B2	IRIS	11/30/2006
1,4-DICHLOROBENZENE	1.1E-05	(ug/m <sup>3</sup> ) <sup>-1</sup>	4.0E-02	mg/kg/day <sup>-1</sup>	2B	OEHHA	11/30/2006
1,4-DIOXANE	7.7E-06	(ug/m <sup>3</sup> ) <sup>-1</sup>	2.7E-02	mg/kg/day <sup>-1</sup>	B2	OEHHA	11/30/2006
2,2,4-TRIMETHYLPENTANE	NA	(ug/m <sup>3</sup> ) <sup>-1</sup>	NA	mg/kg/day <sup>-1</sup>			11/30/2006
2-BUTANONE	NA	(ug/m <sup>3</sup> ) <sup>-1</sup>	NA	mg/kg/day <sup>-1</sup>			11/30/2006
2-METHYLNAPHTHALENE	NA	(ug/m <sup>3</sup> ) <sup>-1</sup>	NA	mg/kg/day <sup>-1</sup>			11/30/2006
4-ETHYLTOLUENE	NA	(ug/m <sup>3</sup> ) <sup>-1</sup>	NA	mg/kg/day <sup>-1</sup>			11/30/2006
ACETONE	NA	(ug/m <sup>3</sup> ) <sup>-1</sup>	NA	mg/kg/day <sup>-1</sup>			11/30/2006
BENZENE	2.9E-05	(ug/m <sup>3</sup> ) <sup>-1</sup>	1.0E-01	mg/kg/day <sup>-1</sup>	A	OEHHA	11/30/2006
BENZO(A)ANTHRACENE	1.1E-04	(ug/m <sup>3</sup> ) <sup>-1</sup>	3.9E-01	mg/kg/day <sup>-1</sup>	B2	OEHHA	11/30/2006
BENZO(A)PYRENE	1.1E-03	(ug/m <sup>3</sup> ) <sup>-1</sup>	3.9E+00	mg/kg/day <sup>-1</sup>	B2	OEHHA	11/30/2006
BENZO(B)FLUORANTHENE	1.1E-04	(ug/m <sup>3</sup> ) <sup>-1</sup>	3.9E-01	mg/kg/day <sup>-1</sup>	B2	OEHHA	11/30/2006
BIS(2-ETHYLHEXYL)PHTHALATE	2.4E-06	(ug/m <sup>3</sup> ) <sup>-1</sup>	8.4E-03	mg/kg/day <sup>-1</sup>	B2	OEHHA	11/30/2006
CARBON DISULFIDE	NA	(ug/m <sup>3</sup> ) <sup>-1</sup>	NA	mg/kg/day <sup>-1</sup>			11/30/2006
CARBON TETRACHLORIDE	4.3E-05	(ug/m <sup>3</sup> ) <sup>-1</sup>	1.5E-01	mg/kg/day <sup>-1</sup>	B2	OEHHA	11/30/2006
CHLOROFORM	2.3E-05	(ug/m <sup>3</sup> ) <sup>-1</sup>	8.1E-02	mg/kg/day <sup>-1</sup>	B2	IRIS	11/30/2006
CHROMIUM	NA	(ug/m <sup>3</sup> ) <sup>-1</sup>	NA	mg/kg/day <sup>-1</sup>	D	IRIS	11/30/2006
CHROMIUM VI	1.5E-01	(ug/m <sup>3</sup> ) <sup>-1</sup>	5.1E+02	mg/kg/day <sup>-1</sup>	A	OEHHA	11/30/2006
DICHLORODIFLUOROMETHANE	NA	(ug/m <sup>3</sup> ) <sup>-1</sup>	NA	mg/kg/day <sup>-1</sup>			11/30/2006
DIELDRIN	4.6E-03	(ug/m <sup>3</sup> ) <sup>-1</sup>	1.6E+01	mg/kg/day <sup>-1</sup>	B2	OEHHA	11/30/2006
ETHYLBENZENE	NA	(ug/m <sup>3</sup> ) <sup>-1</sup>	NA	mg/kg/day <sup>-1</sup>	D	IRIS	11/30/2006
HEXANE (N-HEXANE)	NA	(ug/m <sup>3</sup> ) <sup>-1</sup>	NA	mg/kg/day <sup>-1</sup>			11/30/2006
IRON	NA	(ug/m <sup>3</sup> ) <sup>-1</sup>	NA	mg/kg/day <sup>-1</sup>			11/30/2006
LEAD	1.2E-05	(ug/m <sup>3</sup> ) <sup>-1</sup>	4.2E-02	mg/kg/day <sup>-1</sup>	B2	OEHHA	11/30/2006
METHYLENE CHLORIDE	1.0E-06	(ug/m <sup>3</sup> ) <sup>-1</sup>	3.5E-03	mg/kg/day <sup>-1</sup>	B2	OEHHA	11/30/2006
NAPHTHALENE	3.4E-05	(ug/m <sup>3</sup> ) <sup>-1</sup>	1.2E-01	mg/kg/day <sup>-1</sup>	C	OEHHA	11/30/2006
PCB-1254 (AROCOR 1254)	5.7E-04	(ug/m <sup>3</sup> ) <sup>-1</sup>	2.0E+00	mg/kg/day <sup>-1</sup>	B2	IRIS	11/30/2006
PHENANTHRENE	NA	(ug/m <sup>3</sup> ) <sup>-1</sup>	NA	mg/kg/day <sup>-1</sup>	D	IRIS	11/30/2006
TETRACHLOROETHENE	5.9E-06	(ug/m <sup>3</sup> ) <sup>-1</sup>	2.1E-02	mg/kg/day <sup>-1</sup>	2B	OEHHA	11/30/2006
TETRAHYDROFURAN	1.9E-06	(ug/m <sup>3</sup> ) <sup>-1</sup>	6.8E-03	mg/kg/day <sup>-1</sup>		EPA-Region 9	10/01/2004
TOLUENE	NA	(ug/m <sup>3</sup> ) <sup>-1</sup>	NA	mg/kg/day <sup>-1</sup>			11/30/2006
TRICHLOROETHENE	2.0E-06	(ug/m <sup>3</sup> ) <sup>-1</sup>	7.0E-03	mg/kg/day <sup>-1</sup>	2A	OEHHA	11/30/2006
TRICHLOROFLUOROMETHANE (FREON 11)	NA	(ug/m <sup>3</sup> ) <sup>-1</sup>	NA	mg/kg/day <sup>-1</sup>			11/30/2006

Footnotes:

- Cal-EPA: Technical Support Document for Describing Available Cancer Potency Factors (OEHHA 2003).
- EPA-NCEA: USEPA Region III Provisional Peer Reviewed Toxicity Values for Superfund (PPRTV) (EPA 2005b).
- IRIS: Integrated Risk Information System (EPA 2005a).
- na: Chemical is listed, no value is available.
- ne: Chemical has not been evaluated by EPA for evidence of human carcinogenicity.
- ni: No information available.
- (ug/m<sup>3</sup>)<sup>-1</sup>: cubic meter per microgram
- mg/kg/day<sup>-1</sup>: milligram per kilogram-day.

TABLE A3-7.1A - Parcel Site, CTE  
 CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS  
 Central Tendency Exposure  
 Omega Chemical Site - Whittier, California

Scenario Timeframe:	Current/Future
Receptor Population:	Industrial Worker
Receptor Age:	Adult

Cancer Intake		Noncancer Intake	
Surface Soil		Surface Soil	
Ingestion:	1.7E-07	Ingestion:	4.9E-07
Dermal:	2.3E-06	Dermal:	6.5E-06
Inhalation of soil vapor:	2.3E-02	Inhalation of soil vapor:	6.5E-02
Groundwater		Groundwater	
Inhalation of gw vapor:	2.3E-02	Inhalation of gw vapor:	6.5E-02

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations						
					Value	Units	Intake/ Exposure Concentration		CSF		Cancer Risk	Intake/ Exposure Concentration		RFD		Hazard Quotient		
							Value	Units	Value	Units		Value	Units	Value	Units			
Soil	Surface Soil	Surface Soil at Site	Ingestion	2-METHYLNAPHTHALENE	4.8E-01	mg/kg	8.4E-08	mg/kg/day	NA	mg/kg/day <sup>-1</sup>	---	2.3E-07	mg/kg/day	4.0E-03	mg/kg/day	5.9E-05		
				BIS(2-ETHYLHEXYL)PHTHALATE	1.9E+01	mg/kg	3.4E-06	mg/kg/day	1.4E-02	mg/kg/day <sup>-1</sup>	4.8E-08	9.5E-06	mg/kg/day	2.0E-02	mg/kg/day	4.8E-04		
				CHROMIUM	9.9E+01	mg/kg	1.7E-05	mg/kg/day	NA	mg/kg/day <sup>-1</sup>	---	4.8E-05	mg/kg/day	1.5E+00	mg/kg/day	3.2E-05		
				CHROMIUM VI	1.6E+01	mg/kg	2.9E-06	mg/kg/day	NA	mg/kg/day <sup>-1</sup>	---	8.1E-06	mg/kg/day	3.0E-03	mg/kg/day	2.7E-03		
				DIELDRIN	1.6E-02	mg/kg	2.8E-09	mg/kg/day	1.6E+01	mg/kg/day <sup>-1</sup>	4.5E-08	7.9E-09	mg/kg/day	5.0E-05	mg/kg/day	1.6E-04		
				IRON	2.3E+04	mg/kg	4.1E-03	mg/kg/day	NA	mg/kg/day <sup>-1</sup>	---	1.1E-02	mg/kg/day	3.0E-01	mg/kg/day	3.8E-02		
				LEAD	4.4E+01	mg/kg	7.8E-06	mg/kg/day	8.5E-03	mg/kg/day <sup>-1</sup>	6.6E-08	2.2E-05	mg/kg/day	NA	mg/kg/day	NA		
				NAPHTHALENE	1.2E+00	mg/kg	2.1E-07	mg/kg/day	1.2E-01	mg/kg/day <sup>-1</sup>	2.5E-08	5.9E-07	mg/kg/day	2.0E-02	mg/kg/day	2.9E-05		
				PCB-1254 (AROCOLOR 1254)	2.5E-01	mg/kg	4.4E-08	mg/kg/day	5.0E+00	mg/kg/day <sup>-1</sup>	2.2E-07	1.2E-07	mg/kg/day	2.0E-05	mg/kg/day	6.2E-03		
				PHENANTHRENE	3.0E-02	mg/kg	5.2E-09	mg/kg/day	NA	mg/kg/day <sup>-1</sup>	---	1.5E-08	mg/kg/day	NA	mg/kg/day	NA		
				Exp. Route Total										4.0E-07				4.7E-02
				Dermal	2-METHYLNAPHTHALENE	4.8E-01	mg/kg	1.1E-06	mg/kg/day	NA	mg/kg/day <sup>-1</sup>	---	3.1E-06	mg/kg/day	4.0E-02	mg/kg/day	7.7E-05	
					BIS(2-ETHYLHEXYL)PHTHALATE	1.9E+01	mg/kg	4.5E-05	mg/kg/day	1.4E-03	mg/kg/day <sup>-1</sup>	6.3E-08	1.3E-04	mg/kg/day	2.0E-01	mg/kg/day	6.3E-04	
			CHROMIUM		9.9E+01	mg/kg	2.3E-04	mg/kg/day	NA	mg/kg/day <sup>-1</sup>	---	6.4E-04	mg/kg/day	1.5E+02	mg/kg/day	4.3E-06		
			CHROMIUM VI		1.6E+01	mg/kg	3.8E-05	mg/kg/day	NA	mg/kg/day <sup>-1</sup>	---	1.1E-04	mg/kg/day	NA	mg/kg/day	NA		
			DIELDRIN		1.6E-02	mg/kg	3.7E-08	mg/kg/day	8.0E-01	mg/kg/day <sup>-1</sup>	3.0E-08	1.0E-07	mg/kg/day	1.0E-03	mg/kg/day	1.0E-04		
			IRON		2.3E+04	mg/kg	5.4E-02	mg/kg/day	NA	mg/kg/day <sup>-1</sup>	---	1.5E-01	mg/kg/day	3.0E+01	mg/kg/day	5.0E-03		
			LEAD		4.4E+01	mg/kg	1.0E-04	mg/kg/day	8.5E-05	mg/kg/day <sup>-1</sup>	8.7E-09	2.9E-04	mg/kg/day	NA	mg/kg/day	NA		
			NAPHTHALENE		1.2E+00	mg/kg	2.8E-06	mg/kg/day	1.8E-02	mg/kg/day <sup>-1</sup>	5.0E-08	7.7E-06	mg/kg/day	1.3E-01	mg/kg/day	5.8E-05		
			PCB-1254 (AROCOLOR 1254)		2.5E-01	mg/kg	5.8E-07	mg/kg/day	7.5E-01	mg/kg/day <sup>-1</sup>	4.4E-07	1.6E-06	mg/kg/day	1.3E-04	mg/kg/day	1.2E-02		
			PHENANTHRENE		3.0E-02	mg/kg	6.9E-08	mg/kg/day	NA	mg/kg/day <sup>-1</sup>	---	1.9E-07	mg/kg/day	NA	mg/kg/day	NA		
			Exp. Route Total										5.9E-07				1.8E-02	
			Exposure Point Total										9.9E-07				6.6E-02	
			Surface Soil Total										9.9E-07				6.6E-02	

TABLE A3-7.1A - Parcel Site, CTE  
 CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS  
 Central Tendency Exposure  
 Omega Chemical Site - Whittier, California

Scenario Timeframe:	Current/Future
Receptor Population:	Industrial Worker
Receptor Age:	Adult

Cancer Intake		Noncancer Intake	
Surface Soil		Surface Soil	
Ingestion:	1.7E-07	Ingestion:	4.9E-07
Dermal:	2.3E-06	Dermal:	6.5E-06
Inhalation of soil vapor:	2.3E-02	Inhalation of soil vapor:	6.5E-02
Groundwater		Groundwater	
Inhalation of gw vapor:	2.3E-02	Inhalation of gw vapor:	6.5E-02

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations				Non-Cancer Hazard Calculations					
					Value	Units	Intake/ Exposure Concentration		CSF		Cancer Risk	Intake/ Exposure Concentration		RfD		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Indoor Air	Indoor Air	Indoor Air	Inhalation	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	1.7E+01	ug/m3	3.9E-04	mg/kg/day	NA	mg/kg/day <sup>-1</sup>	---	1.1E-03	mg/kg/day	NA	mg/kg/day	NA
				1,1-DICHLOROETHENE	1.6E+01	ug/m3	3.6E-04	mg/kg/day	NA	mg/kg/day <sup>-1</sup>	---	1.0E-03	mg/kg/day	5.7E-02	mg/kg/day	1.8E-02
				ACETONE	5.9E+03	ug/m3	1.4E-01	mg/kg/day	NA	mg/kg/day <sup>-1</sup>	---	3.9E-01	mg/kg/day	9.0E-01	mg/kg/day	4.3E-01
				BENZENE	9.7E+00	ug/m3	2.3E-04	mg/kg/day	1.0E-01	mg/kg/day <sup>-1</sup>	2.3E-05	6.3E-04	mg/kg/day	8.6E-03	mg/kg/day	7.4E-02
				CARBON TETRACHLORIDE	6.9E-01	ug/m3	1.6E-05	mg/kg/day	1.5E-01	mg/kg/day <sup>-1</sup>	2.4E-06	4.5E-05	mg/kg/day	1.1E-02	mg/kg/day	3.9E-03
				CHLOROFORM	2.4E-01	ug/m3	5.7E-06	mg/kg/day	8.1E-02	mg/kg/day <sup>-1</sup>	4.6E-07	1.6E-05	mg/kg/day	8.6E-02	mg/kg/day	1.9E-04
				DICHLORODIFLUOROMETHANE	3.1E+00	ug/m3	7.1E-05	mg/kg/day	NA	mg/kg/day <sup>-1</sup>	---	2.0E-04	mg/kg/day	5.7E-02	mg/kg/day	3.5E-03
				ETHYLBENZENE	2.6E+01	ug/m3	5.9E-04	mg/kg/day	NA	mg/kg/day <sup>-1</sup>	---	1.7E-03	mg/kg/day	2.9E-01	mg/kg/day	5.8E-03
				METHYLENE CHLORIDE	2.6E+02	ug/m3	6.0E-03	mg/kg/day	3.5E-03	mg/kg/day <sup>-1</sup>	2.1E-05	1.7E-02	mg/kg/day	1.1E-01	mg/kg/day	1.5E-01
				TETRACHLOROETHENE	1.8E+01	ug/m3	4.3E-04	mg/kg/day	2.1E-02	mg/kg/day <sup>-1</sup>	8.8E-06	1.2E-03	mg/kg/day	1.0E-02	mg/kg/day	1.2E-01
				TOLUENE	2.0E+03	ug/m3	4.6E-02	mg/kg/day	NA	mg/kg/day <sup>-1</sup>	---	1.3E-01	mg/kg/day	8.6E-02	mg/kg/day	1.5E+00
				TRICHLOROETHENE	5.3E+00	ug/m3	1.2E-04	mg/kg/day	7.0E-03	mg/kg/day <sup>-1</sup>	8.6E-07	3.5E-04	mg/kg/day	1.7E-01	mg/kg/day	2.0E-03
				TRICHLOROFLUOROMETHANE (FREON 11)	9.0E+00	ug/m3	2.1E-04	mg/kg/day	NA	mg/kg/day <sup>-1</sup>	---	5.8E-04	mg/kg/day	2.0E-01	mg/kg/day	2.9E-03
				Exp. Route Total										5.6E-05		
Exposure Point Total										5.6E-05						2.3E+00
Indoor Air Total										5.6E-05						2.3E+00
Total of Receptor Risks Across All Media										5.7E-05	Total of Receptor Hazards Across All Media				2.4E+00	

ND: Not Detected.  
 NS: Not selected as an exposure pathway.  
 na: The chemical is listed, value is not available.  
 ne: The compound has not been evaluated by EPA for evidence of human carcinogenicity.

---: Risk was not calculated for chemical.  
 mg/kg: milligram per kilogram.  
 mg/kg/day: milligram per kilogram per day.  
 mg/kg/day<sup>-1</sup>: milligram per kilogram-day.

TABLE A3-7.1B - Parcel North, CTE  
 CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS  
 Central Tendency Exposure  
 Omega Chemical Site - Whittier, California

Scenario Timeframe:	Current/Future
Receptor Population:	Industrial Worker
Receptor Age:	Adult

Cancer Intake		Noncancer Intake	
Surface Soil		Surface Soil	
Ingestion:	1.7E-07	Ingestion:	4.9E-07
Dermal:	2.3E-06	Dermal:	6.5E-06
Inhalation of soil vapor:	2.3E-02	Inhalation of soil vapor:	6.5E-02
Groundwater		Groundwater	
Inhalation of gw vapor:	2.3E-02	Inhalation of gw vapor:	6.5E-02

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations				Non-Cancer Hazard Calculations								
					Value	Units	Intake/ Exposure Concentration		CSF		Cancer Risk	Intake/ Exposure Concentration		RfD		Hazard Quotient			
							Value	Units	Value	Units		Value	Units	Value	Units				
Indoor Air	Indoor Air	Indoor Air	Inhalation	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	3.9E+01	ug/m3	9.1E-04	mg/kg/day	NA	mg/kg/day <sup>-1</sup>	---	2.5E-03	mg/kg/day	NA	mg/kg/day	NA			
				1,1-DICHLOROETHENE	8.7E+00	ug/m3	2.0E-04	mg/kg/day	NA	mg/kg/day <sup>-1</sup>	---	5.7E-04	mg/kg/day	5.7E-02	mg/kg/day	9.9E-03			
				1,4-DICHLOROBENZENE	7.8E-01	ug/m3	1.8E-05	mg/kg/day	4.0E-02	mg/kg/day <sup>-1</sup>	7.3E-07	5.1E-05	mg/kg/day	2.3E-01	mg/kg/day	2.2E-04			
				ACETONE	3.3E+03	ug/m3	7.7E-02	mg/kg/day	NA	mg/kg/day <sup>-1</sup>	---	2.2E-01	mg/kg/day	9.0E-01	mg/kg/day	2.4E-01			
				BENZENE	1.1E+00	ug/m3	2.4E-05	mg/kg/day	1.0E-01	mg/kg/day <sup>-1</sup>	2.4E-06	6.8E-05	mg/kg/day	8.6E-03	mg/kg/day	8.0E-03			
				CARBON TETRACHLORIDE	8.2E-01	ug/m3	1.9E-05	mg/kg/day	1.5E-01	mg/kg/day <sup>-1</sup>	2.8E-06	5.3E-05	mg/kg/day	1.1E-02	mg/kg/day	4.7E-03			
				CHLOROFORM	3.4E-01	ug/m3	7.9E-06	mg/kg/day	8.1E-02	mg/kg/day <sup>-1</sup>	6.4E-07	2.2E-05	mg/kg/day	8.6E-02	mg/kg/day	2.6E-04			
				DICHLORODIFLUOROMETHANE	3.0E+00	ug/m3	7.0E-05	mg/kg/day	NA	mg/kg/day <sup>-1</sup>	---	2.0E-04	mg/kg/day	5.7E-02	mg/kg/day	3.4E-03			
				ETHYLBENZENE	8.2E-01	ug/m3	1.9E-05	mg/kg/day	NA	mg/kg/day <sup>-1</sup>	---	5.4E-05	mg/kg/day	2.9E-01	mg/kg/day	1.9E-04			
				METHYLENE CHLORIDE	4.9E+00	ug/m3	1.1E-04	mg/kg/day	3.5E-03	mg/kg/day <sup>-1</sup>	3.9E-07	3.2E-04	mg/kg/day	1.1E-01	mg/kg/day	2.8E-03			
				TETRACHLOROETHENE	2.2E+01	ug/m3	5.2E-04	mg/kg/day	2.1E-02	mg/kg/day <sup>-1</sup>	1.1E-05	1.5E-03	mg/kg/day	1.0E-02	mg/kg/day	1.5E-01			
				TRICHLOROETHENE	1.3E+01	ug/m3	3.1E-04	mg/kg/day	7.0E-03	mg/kg/day <sup>-1</sup>	2.2E-06	8.7E-04	mg/kg/day	1.7E-01	mg/kg/day	5.1E-03			
				TRICHLOROFLUOROMETHANE (FREON 11)	1.1E+01	ug/m3	2.6E-04	mg/kg/day	NA	mg/kg/day <sup>-1</sup>	---	7.3E-04	mg/kg/day	2.0E-01	mg/kg/day	3.7E-03			
				Exp. Route Total										2.0E-05					4.2E-01
				Exposure Point Total										2.0E-05					
Indoor Air Total										2.0E-05					4.2E-01				
Total of Receptor Risks Across All Media										2.0E-05	Total of Receptor Hazards Across All Media					4.2E-01			

ND: Not Detected. ---: Risk was not calculated for chemical. (1) The total only includes the maximum calculated risks and hazards of the inhalation pathways through  
 NS: Not selected as an exposure pathway. mg/kg: milligram per kilogram. soil gas, groundwater, and indoor air since receptors are exposed to these media all through the indoor  
 na: The chemical is listed, value is not available. mg/kg/day: milligram per kilogram per day. air pathway.  
 ne: The compound has not been evaluated by EPA for evidence of human carcinogenicity. mg/kg/day<sup>-1</sup>: milligram per kilogram-day.

TABLE A3-7.1C - Parcel West, CTE  
 CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS  
 Central Tendency Exposure  
 Omega Chemical Site - Whittier, California

Scenario Timeframe:	Current/Future
Receptor Population:	Industrial Worker
Receptor Age:	Adult

Cancer Intake		Noncancer Intake	
Surface Soil		Surface Soil	
Ingestion:	1.7E-07	Ingestion:	4.9E-07
Dermal:	2.3E-06	Dermal:	6.5E-06
Inhalation of soil vapor:	2.3E-02	Inhalation of soil vapor:	6.5E-02
Groundwater		Groundwater	
Inhalation of gw vapor:	2.3E-02	Inhalation of gw vapor:	6.5E-02

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations				Non-Cancer Hazard Calculations					
					Value	Units	Intake/ Exposure Concentration		CSF	Cancer Risk	Intake/ Exposure Concentration		RfD		Hazard Quotient	
							Value	Units			Value	Units	Value	Units		
Indoor Air	Indoor Air	Indoor Air	Inhalation	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	2.6E+01	ug/m3	6.0E-04	mg/kg/day	NA	mg/kg/day <sup>-1</sup>	---	1.7E-03	mg/kg/day	NA	mg/kg/day	NA
				1,1-DICHLOROETHENE	2.3E+01	ug/m3	5.2E-04	mg/kg/day	NA	mg/kg/day <sup>-1</sup>	---	1.5E-03	mg/kg/day	5.7E-02	mg/kg/day	2.6E-02
				1,4-DICHLOROBENZENE	3.0E-01	ug/m3	7.0E-06	mg/kg/day	4.0E-02	mg/kg/day <sup>-1</sup>	2.8E-07	2.0E-05	mg/kg/day	2.3E-01	mg/kg/day	8.5E-05
				ACETONE	4.3E+01	ug/m3	9.9E-04	mg/kg/day	NA	mg/kg/day <sup>-1</sup>	---	2.8E-03	mg/kg/day	9.0E-01	mg/kg/day	3.1E-03
				BENZENE	1.4E+00	ug/m3	3.3E-05	mg/kg/day	1.0E-01	mg/kg/day <sup>-1</sup>	3.3E-06	9.4E-05	mg/kg/day	8.6E-03	mg/kg/day	1.1E-02
				CARBON TETRACHLORIDE	6.9E-01	ug/m3	1.6E-05	mg/kg/day	1.5E-01	mg/kg/day <sup>-1</sup>	2.4E-06	4.5E-05	mg/kg/day	1.1E-02	mg/kg/day	3.9E-03
				CHLOROFORM	2.4E-01	ug/m3	5.7E-06	mg/kg/day	8.1E-02	mg/kg/day <sup>-1</sup>	4.6E-07	1.6E-05	mg/kg/day	8.6E-02	mg/kg/day	1.9E-04
				DICHLORODIFLUOROMETHANE	2.9E+00	ug/m3	6.7E-05	mg/kg/day	NA	mg/kg/day <sup>-1</sup>	---	1.9E-04	mg/kg/day	5.7E-02	mg/kg/day	3.3E-03
				ETHYLBENZENE	1.6E+00	ug/m3	3.6E-05	mg/kg/day	NA	mg/kg/day <sup>-1</sup>	---	1.0E-04	mg/kg/day	2.9E-01	mg/kg/day	3.5E-04
				METHYLENE CHLORIDE	1.5E+00	ug/m3	3.5E-05	mg/kg/day	3.5E-03	mg/kg/day <sup>-1</sup>	1.2E-07	9.7E-05	mg/kg/day	1.1E-01	mg/kg/day	8.5E-04
				TETRACHLOROETHENE	1.0E+02	ug/m3	2.4E-03	mg/kg/day	2.1E-02	mg/kg/day <sup>-1</sup>	4.9E-05	6.6E-03	mg/kg/day	1.0E-02	mg/kg/day	6.6E-01
				TRICHLOROETHENE	4.3E+00	ug/m3	1.0E-04	mg/kg/day	7.0E-03	mg/kg/day <sup>-1</sup>	7.0E-07	2.8E-04	mg/kg/day	1.7E-01	mg/kg/day	1.6E-03
				TRICHLOROFLUOROMETHANE (FREON 11)	6.7E+00	ug/m3	1.6E-04	mg/kg/day	NA	mg/kg/day <sup>-1</sup>	---	4.4E-04	mg/kg/day	2.0E-01	mg/kg/day	2.2E-03
				Exp. Route Total									5.6E-05			
Exposure Point Total									5.6E-05				7.1E-01			
Indoor Air Total									5.6E-05				7.1E-01			
									Total of Receptor Risks Across All Media		5.6E-05		Total of Receptor Hazards Across All Media		7.1E-01	

ND: Not Detected.  
 NS: Not selected as an exposure pathway.  
 na: The chemical is listed, value is not available.  
 ne: The compound has not been evaluated by EPA for evidence of human carcinogenicity.

---: Risk was not calculated for chemical.  
 mg/kg: milligram per kilogram.  
 mg/kg/day: milligram per kilogram per day.  
 mg/kg/day<sup>-1</sup>: milligram per kilogram-day.

TABLE A3-7.1D - Parcel South - Bishop, CTE  
 CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS  
 Central Tendency Exposure  
 Omega Chemical Site - Whittier, California

Scenario Timeframe:	Current/Future
Receptor Population:	Industrial Worker
Receptor Age:	Adult

Cancer Intake		Noncancer Intake	
Surface Soil		Surface Soil	
Ingestion:	1.7E-07	Ingestion:	4.9E-07
Dermal:	2.3E-06	Dermal:	6.5E-06
Inhalation of soil vapor:	2.3E-02	Inhalation of soil vapor:	6.5E-02
Groundwater		Groundwater	
Inhalation of gw vapor:	2.3E-02	Inhalation of gw vapor:	6.5E-02

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations							
					Value	Units	Intake/ Exposure Concentration		CSF		Cancer Risk	Intake/ Exposure Concentration		RfD		Hazard Quotient			
							Value	Units	Value	Units		Value	Units	Value	Units				
Indoor Air	Indoor Air	Indoor Air	Inhalation	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	1.0E+01	ug/m3	2.3E-04	mg/kg/day	NA	mg/kg/day <sup>-1</sup>	---	6.5E-04	mg/kg/day	NA	mg/kg/day	NA			
				1,1-DICHLOROETHENE	1.4E+01	ug/m3	3.3E-04	mg/kg/day	NA	mg/kg/day <sup>-1</sup>	---	9.3E-04	mg/kg/day	5.7E-02	mg/kg/day	1.6E-02			
				1,4-DICHLOROBENZENE	3.2E-01	ug/m3	7.4E-06	mg/kg/day	4.0E-02	mg/kg/day <sup>-1</sup>	3.0E-07	2.1E-05	mg/kg/day	2.3E-01	mg/kg/day	9.1E-05			
				ACETONE	4.1E+01	ug/m3	9.6E-04	mg/kg/day	NA	mg/kg/day <sup>-1</sup>	---	2.7E-03	mg/kg/day	9.0E-01	mg/kg/day	3.0E-03			
				BENZENE	1.3E+00	ug/m3	2.9E-05	mg/kg/day	1.0E-01	mg/kg/day <sup>-1</sup>	2.9E-06	8.1E-05	mg/kg/day	8.6E-03	mg/kg/day	9.5E-03			
				CARBON TETRACHLORIDE	5.7E-01	ug/m3	1.3E-05	mg/kg/day	1.5E-01	mg/kg/day <sup>-1</sup>	2.0E-06	3.7E-05	mg/kg/day	1.1E-02	mg/kg/day	3.3E-03			
				CHLOROFORM	1.8E-01	ug/m3	4.1E-06	mg/kg/day	8.1E-02	mg/kg/day <sup>-1</sup>	3.3E-07	1.1E-05	mg/kg/day	8.6E-02	mg/kg/day	1.3E-04			
				DICHLORODIFLUOROMETHANE	3.0E+00	ug/m3	6.9E-05	mg/kg/day	NA	mg/kg/day <sup>-1</sup>	---	1.9E-04	mg/kg/day	5.7E-02	mg/kg/day	3.4E-03			
				ETHYLBENZENE	1.7E+00	ug/m3	4.0E-05	mg/kg/day	NA	mg/kg/day <sup>-1</sup>	---	1.1E-04	mg/kg/day	2.9E-01	mg/kg/day	4.0E-04			
				METHYLENE CHLORIDE	1.7E+00	ug/m3	3.9E-05	mg/kg/day	3.5E-03	mg/kg/day <sup>-1</sup>	1.4E-07	1.1E-04	mg/kg/day	1.1E-01	mg/kg/day	9.7E-04			
				TETRACHLOROETHENE	2.9E+01	ug/m3	6.8E-04	mg/kg/day	2.1E-02	mg/kg/day <sup>-1</sup>	1.4E-05	1.9E-03	mg/kg/day	1.0E-02	mg/kg/day	1.9E-01			
				TRICHLOROFLUOROMETHANE (FREON 11)	3.7E+00	ug/m3	8.5E-05	mg/kg/day	NA	mg/kg/day <sup>-1</sup>	---	2.4E-04	mg/kg/day	2.0E-01	mg/kg/day	1.2E-03			
				Exp. Route Total										2.0E-05					2.3E-01
				Exposure Point Total										2.0E-05					
Indoor Air Total										2.0E-05						2.3E-01			
Total of Receptor Risks Across All Media										2.0E-05	Total of Receptor Hazards Across All Media					2.3E-01			

ND: Not Detected.  
 NS: Not selected as an exposure pathway.  
 na: The chemical is listed, value is not available.  
 ne: The compound has not been evaluated by EPA for evidence of human carcinogenicity.

---: Risk was not calculated for chemical.  
 mg/kg: milligram per kilogram.  
 mg/kg/day: milligram per kilogram per day.  
 mg/kg/day<sup>-1</sup>: milligram per kilogram-day.

TABLE A3-7.1E - Parcel South - LA Carts/Oncology Care, CTE  
 CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS  
 Central Tendency Exposure  
 Omega Chemical Site - Whittier, California

Scenario Timeframe:	Current/Future
Receptor Population:	Industrial Worker
Receptor Age:	Adult

Cancer Intake		Noncancer Intake	
Surface Soil		Surface Soil	
Ingestion:	1.7E-07	Ingestion:	4.9E-07
Dermal:	2.3E-06	Dermal:	6.5E-06
Inhalation of soil vapor:	2.3E-02	Inhalation of soil vapor:	6.5E-02
Groundwater		Groundwater	
Inhalation of gw vapor:	2.3E-02	Inhalation of gw vapor:	6.5E-02

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations							
					Value	Units	Intake/ Exposure Concentration		CSF		Cancer Risk	Intake/ Exposure Concentration		RfD		Hazard Quotient			
							Value	Units	Value	Units		Value	Units	Value	Units				
Indoor Air	Indoor Air	Indoor Air	Inhalation	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	1.1E+01	ug/m3	2.6E-04	mg/kg/day	NA	mg/kg/day <sup>-1</sup>	---	7.2E-04	mg/kg/day	NA	mg/kg/day	NA			
				1,1-DICHLOROETHENE	2.9E+00	ug/m3	6.7E-05	mg/kg/day	NA	mg/kg/day <sup>-1</sup>	---	1.9E-04	mg/kg/day	5.7E-02	mg/kg/day	3.3E-03			
				1,2-DICHLOROETHANE	3.1E-01	ug/m3	7.2E-06	mg/kg/day	9.1E-02	mg/kg/day <sup>-1</sup>	6.6E-07	2.0E-05	mg/kg/day	1.4E-03	mg/kg/day	1.4E-02			
				1,4-DICHLOROBENZENE	3.9E-01	ug/m3	9.1E-06	mg/kg/day	4.0E-02	mg/kg/day <sup>-1</sup>	3.6E-07	2.5E-05	mg/kg/day	2.3E-01	mg/kg/day	1.1E-04			
				ACETONE	1.2E+03	ug/m3	2.7E-02	mg/kg/day	NA	mg/kg/day <sup>-1</sup>	---	7.6E-02	mg/kg/day	9.0E-01	mg/kg/day	8.4E-02			
				BENZENE	1.9E+00	ug/m3	4.5E-05	mg/kg/day	1.0E-01	mg/kg/day <sup>-1</sup>	4.5E-06	1.2E-04	mg/kg/day	8.6E-03	mg/kg/day	1.5E-02			
				CARBON TETRACHLORIDE	5.2E-01	ug/m3	1.2E-05	mg/kg/day	1.5E-01	mg/kg/day <sup>-1</sup>	1.8E-06	3.4E-05	mg/kg/day	1.1E-02	mg/kg/day	2.9E-03			
				CHLOROFORM	6.3E-01	ug/m3	1.5E-05	mg/kg/day	8.1E-02	mg/kg/day <sup>-1</sup>	1.2E-06	4.1E-05	mg/kg/day	8.6E-02	mg/kg/day	4.8E-04			
				DICHLORODIFLUOROMETHANE	3.3E+00	ug/m3	7.7E-05	mg/kg/day	NA	mg/kg/day <sup>-1</sup>	---	2.2E-04	mg/kg/day	5.7E-02	mg/kg/day	3.8E-03			
				ETHYLBENZENE	1.8E+00	ug/m3	4.2E-05	mg/kg/day	NA	mg/kg/day <sup>-1</sup>	---	1.2E-04	mg/kg/day	2.9E-01	mg/kg/day	4.1E-04			
				METHYLENE CHLORIDE	5.4E+00	ug/m3	1.2E-04	mg/kg/day	3.5E-03	mg/kg/day <sup>-1</sup>	4.4E-07	3.5E-04	mg/kg/day	1.1E-01	mg/kg/day	3.1E-03			
				TETRACHLOROETHENE	1.6E+00	ug/m3	3.8E-05	mg/kg/day	2.1E-02	mg/kg/day <sup>-1</sup>	7.8E-07	1.1E-04	mg/kg/day	1.0E-02	mg/kg/day	1.1E-02			
				TOLUENE	5.7E+02	ug/m3	1.3E-02	mg/kg/day	NA	mg/kg/day <sup>-1</sup>	---	3.7E-02	mg/kg/day	8.6E-02	mg/kg/day	4.3E-01			
				TRICHLOROFLUOROMETHANE (FREON 11)	3.0E+00	ug/m3	6.9E-05	mg/kg/day	NA	mg/kg/day <sup>-1</sup>	---	1.9E-04	mg/kg/day	2.0E-01	mg/kg/day	9.7E-04			
				Exp. Route Total										9.7E-06					5.7E-01
				Exposure Point Total										9.7E-06					
Indoor Air Total										9.7E-06					5.7E-01				
										Total of Receptor Risks Across All Media	9.7E-06	Total of Receptor Hazards Across All Media			5.7E-01				

ND: Not Detected.  
 NS: Not selected as an exposure pathway.  
 na: The chemical is listed, value is not available.  
 ne: The compound has not been evaluated by EPA for evidence of human carcinogenicity.

---: Risk was not calculated for chemical.  
 mg/kg: milligram per kilogram.  
 mg/kg/day: milligram per kilogram per day.  
 mg/kg/day<sup>-1</sup>: milligram per kilogram-day.

TABLE A3-7.1F - Parcel South, CTE  
 CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS  
 Central Tendency Exposure  
 Omega Chemical Site - Whittier, California

Scenario Timeframe:	Current/Future
Receptor Population:	Industrial Worker
Receptor Age:	Adult

Cancer Intake		Noncancer Intake	
Surface Soil		Surface Soil	
Ingestion:	1.7E-07	Ingestion:	4.9E-07
Dermal:	2.3E-06	Dermal:	6.5E-06
Inhalation of soil vapor:	2.3E-02	Inhalation of soil vapor:	6.5E-02
Groundwater		Groundwater	
Inhalation of gw vapor:	2.3E-02	Inhalation of gw vapor:	6.5E-02

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations				Non-Cancer Hazard Calculations					
					Value	Units	Intake/ Exposure Concentration		CSF		Cancer Risk	Intake/ Exposure Concentration		RfD		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Soil Gas	Indoor Air	Indoor Air	Inhalation	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	6.4E+02	ug/m3	1.5E-02	mg/kg/day	NA	mg/kg/day <sup>-1</sup>	---	4.2E-02	mg/kg/day	NA	mg/kg/day	NA
				1,1-DICHLOROETHENE	2.4E+02	ug/m3	5.5E-03	mg/kg/day	NA	mg/kg/day <sup>-1</sup>	---	1.5E-02	mg/kg/day	5.7E-02	mg/kg/day	2.7E-01
				1,2,4-TRIMETHYLBENZENE	3.1E-03	ug/m3	7.1E-08	mg/kg/day	NA	mg/kg/day <sup>-1</sup>	---	2.0E-07	mg/kg/day	1.7E-03	mg/kg/day	1.2E-04
				2,2,4-TRIMETHYLPENTANE	NA	ug/m3	---	mg/kg/day	NA	mg/kg/day <sup>-1</sup>	---	---	mg/kg/day	NA	mg/kg/day	NA
				2-BUTANONE	2.1E-03	ug/m3	4.8E-08	mg/kg/day	NA	mg/kg/day <sup>-1</sup>	---	1.4E-07	mg/kg/day	1.4E+00	mg/kg/day	9.5E-08
				4-ETHYLTOLUENE	NA	ug/m3	---	mg/kg/day	NA	mg/kg/day <sup>-1</sup>	---	---	mg/kg/day	NA	mg/kg/day	NA
				ACETONE	6.8E-02	ug/m3	1.6E-06	mg/kg/day	NA	mg/kg/day <sup>-1</sup>	---	4.4E-06	mg/kg/day	9.0E-01	mg/kg/day	4.9E-06
				CARBON DISULFIDE	3.5E-03	ug/m3	8.2E-08	mg/kg/day	NA	mg/kg/day <sup>-1</sup>	---	2.3E-07	mg/kg/day	2.0E-01	mg/kg/day	1.2E-06
				CHLOROFORM	3.9E-03	ug/m3	9.0E-08	mg/kg/day	8.1E-02	mg/kg/day <sup>-1</sup>	7.2E-09	2.5E-07	mg/kg/day	8.6E-02	mg/kg/day	2.9E-06
				DICHLORODIFLUOROMETHANE	2.1E+00	ug/m3	4.9E-05	mg/kg/day	NA	mg/kg/day <sup>-1</sup>	---	1.4E-04	mg/kg/day	5.7E-02	mg/kg/day	2.4E-03
				HEXANE (N-HEXANE)	5.1E-03	ug/m3	1.2E-07	mg/kg/day	NA	mg/kg/day <sup>-1</sup>	---	3.3E-07	mg/kg/day	2.0E-01	mg/kg/day	1.7E-06
				TETRACHLOROETHENE	1.9E+01	ug/m3	4.4E-04	mg/kg/day	2.1E-02	mg/kg/day <sup>-1</sup>	9.0E-06	1.2E-03	mg/kg/day	1.0E-02	mg/kg/day	1.2E-01
				TRICHLOROETHENE	1.1E+01	ug/m3	2.5E-04	mg/kg/day	7.0E-03	mg/kg/day <sup>-1</sup>	1.8E-06	7.0E-04	mg/kg/day	1.7E-01	mg/kg/day	4.1E-03
				TRICHLOROFLUOROMETHANE (FREON 11)	1.5E+02	ug/m3	3.4E-03	mg/kg/day	NA	mg/kg/day <sup>-1</sup>	---	9.5E-03	mg/kg/day	2.0E-01	mg/kg/day	4.8E-02
							Exp. Route Total							1.1E-05		
			Exposure Point Total							1.1E-05					4.5E-01	
Soil Gas Total										1.1E-05					4.5E-01	
										Total of Receptor Risks Across All Media		1.1E-05	Total of Receptor Hazards Across All Media		4.5E-01	

ND: Not Detected.  
 NS: Not selected as an exposure pathway.  
 na: The chemical is listed, value is not available.  
 ne: The compound has not been evaluated by EPA for evidence of human carcinogenicity.

---: Risk was not calculated for chemical.  
 mg/kg: milligram per kilogram.  
 mg/kg/day: milligram per kilogram per day.  
 mg/kg/day<sup>-1</sup>: milligram per kilogram-day.

TABLE A3-7.2A - Parcel Site, RME  
 CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS  
 Reasonable Maximum Exposure  
 Omega Chemical Site - Whittier, California

Scenario Timeframe:	Current/Future
Receptor Population:	Industrial Worker
Receptor Age:	Adult

Cancer Intake		Noncancer Intake	
Surface Soil		Surface Soil	
Ingestion:	3.5E-07	Ingestion:	9.8E-07
Dermal:	2.3E-06	Dermal:	6.5E-06
Inhalation of soil vapor:	3.4E-02	Inhalation of soil vapor:	9.4E-02
Groundwater		Groundwater	
Inhalation of gw vapor:	3.4E-02	Inhalation of gw vapor:	9.4E-02

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations					
					Value	Units	Intake/ Exposure Concentration		CSF		Cancer Risk	Intake/ Exposure Concentration		RFD		Hazard Quotient	
							Value	Units	Value	Units		Value	Units	Value	Units		
Soil	Surface Soil	Surface Soil at Site	Ingestion	2-METHYLNAPHTHALENE	4.8E-01	mg/kg	1.7E-07	mg/kg/day	NA	mg/kg/day <sup>-1</sup>	---	4.7E-07	mg/kg/day	4.0E-03	mg/kg/day	1.2E-04	
				BIS(2-ETHYLHEXYL)PHTHALATE	1.9E+01	mg/kg	6.8E-06	mg/kg/day	1.4E-02	mg/kg/day <sup>-1</sup>	9.5E-08	1.9E-05	mg/kg/day	2.0E-02	mg/kg/day	9.5E-04	
				CHROMIUM	9.9E+01	mg/kg	3.5E-05	mg/kg/day	NA	mg/kg/day <sup>-1</sup>	---	9.7E-05	mg/kg/day	1.5E+00	mg/kg/day	6.5E-05	
				CHROMIUM VI	1.6E+01	mg/kg	5.8E-06	mg/kg/day	NA	mg/kg/day <sup>-1</sup>	---	1.6E-05	mg/kg/day	3.0E-03	mg/kg/day	5.4E-03	
				DIELDRIN	1.6E-02	mg/kg	5.6E-09	mg/kg/day	1.6E+01	mg/kg/day <sup>-1</sup>	9.0E-08	1.6E-08	mg/kg/day	5.0E-05	mg/kg/day	3.1E-04	
				IRON	2.3E+04	mg/kg	8.1E-03	mg/kg/day	NA	mg/kg/day <sup>-1</sup>	---	2.3E-02	mg/kg/day	3.0E-01	mg/kg/day	7.6E-02	
				LEAD	4.4E+01	mg/kg	1.6E-05	mg/kg/day	8.5E-03	mg/kg/day <sup>-1</sup>	1.3E-07	4.3E-05	mg/kg/day	NA	mg/kg/day	NA	
				NAPHTHALENE	1.2E+00	mg/kg	4.2E-07	mg/kg/day	1.2E-01	mg/kg/day <sup>-1</sup>	5.0E-08	1.2E-06	mg/kg/day	2.0E-02	mg/kg/day	5.9E-05	
				PCB-1254 (AROCOLOR 1254)	2.5E-01	mg/kg	8.8E-08	mg/kg/day	5.0E+00	mg/kg/day <sup>-1</sup>	4.4E-07	2.5E-07	mg/kg/day	2.0E-05	mg/kg/day	1.2E-02	
				PHENANTHRENE	3.0E-02	mg/kg	1.0E-08	mg/kg/day	NA	mg/kg/day <sup>-1</sup>	---	2.9E-08	mg/kg/day	NA	mg/kg/day	NA	
			Exp. Route Total								8.1E-07						9.5E-02
			Dermal	2-METHYLNAPHTHALENE	4.8E-01	mg/kg	1.1E-06	mg/kg/day	NA	mg/kg/day <sup>-1</sup>	---	3.1E-06	mg/kg/day	4.0E-02	mg/kg/day	7.7E-05	
				BIS(2-ETHYLHEXYL)PHTHALATE	1.9E+01	mg/kg	4.5E-05	mg/kg/day	1.4E-03	mg/kg/day <sup>-1</sup>	6.3E-08	1.3E-04	mg/kg/day	2.0E-01	mg/kg/day	6.3E-04	
				CHROMIUM	9.9E+01	mg/kg	2.3E-04	mg/kg/day	NA	mg/kg/day <sup>-1</sup>	---	6.4E-04	mg/kg/day	1.5E+02	mg/kg/day	4.3E-06	
				CHROMIUM VI	1.6E+01	mg/kg	3.8E-05	mg/kg/day	NA	mg/kg/day <sup>-1</sup>	---	1.1E-04	mg/kg/day	NA	mg/kg/day	NA	
				DIELDRIN	1.6E-02	mg/kg	3.7E-08	mg/kg/day	8.0E-01	mg/kg/day <sup>-1</sup>	3.0E-08	1.0E-07	mg/kg/day	1.0E-03	mg/kg/day	1.0E-04	
				IRON	2.3E+04	mg/kg	5.4E-02	mg/kg/day	NA	mg/kg/day <sup>-1</sup>	---	1.5E-01	mg/kg/day	3.0E+01	mg/kg/day	5.0E-03	
				LEAD	4.4E+01	mg/kg	1.0E-04	mg/kg/day	8.5E-05	mg/kg/day <sup>-1</sup>	8.7E-09	2.9E-04	mg/kg/day	NA	mg/kg/day	NA	
				NAPHTHALENE	1.2E+00	mg/kg	2.8E-06	mg/kg/day	1.8E-02	mg/kg/day <sup>-1</sup>	5.0E-08	7.7E-06	mg/kg/day	1.3E-01	mg/kg/day	5.8E-05	
				PCB-1254 (AROCOLOR 1254)	2.5E-01	mg/kg	5.8E-07	mg/kg/day	7.5E-01	mg/kg/day <sup>-1</sup>	4.4E-07	1.6E-06	mg/kg/day	1.3E-04	mg/kg/day	1.2E-02	
				PHENANTHRENE	3.0E-02	mg/kg	6.9E-08	mg/kg/day	NA	mg/kg/day <sup>-1</sup>	---	1.9E-07	mg/kg/day	NA	mg/kg/day	NA	
			Exp. Route Total								5.9E-07					1.8E-02	
			Exposure Point Total									1.4E-06					1.1E-01
			Surface Soil Total									1.4E-06					1.1E-01

TABLE A3-7.2A - Parcel Site, RME  
 CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS  
 Reasonable Maximum Exposure  
 Omega Chemical Site - Whittier, California

Scenario Timeframe:	Current/Future
Receptor Population:	Industrial Worker
Receptor Age:	Adult

Cancer Intake		Noncancer Intake	
Surface Soil		Surface Soil	
Ingestion:	3.5E-07	Ingestion:	9.8E-07
Dermal:	2.3E-06	Dermal:	6.5E-06
Inhalation of soil vapor:	3.4E-02	Inhalation of soil vapor:	9.4E-02
Groundwater		Groundwater	
Inhalation of gw vapor:	3.4E-02	Inhalation of gw vapor:	9.4E-02

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations				Non-Cancer Hazard Calculations								
					Value	Units	Intake/ Exposure Concentration		CSF		Cancer Risk	Intake/ Exposure Concentration		RfD		Hazard Quotient			
							Value	Units	Value	Units		Value	Units	Value	Units				
Indoor Air	Indoor Air	Indoor Air	Inhalation	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	1.7E+01	ug/m3	5.7E-04	mg/kg/day	NA	mg/kg/day <sup>-1</sup>	---	1.6E-03	mg/kg/day	NA	mg/kg/day	NA			
				1,1-DICHLOROETHENE	1.6E+01	ug/m3	5.2E-04	mg/kg/day	NA	mg/kg/day <sup>-1</sup>	---	1.5E-03	mg/kg/day	5.7E-02	mg/kg/day	2.6E-02			
				ACETONE	5.9E+03	ug/m3	2.0E-01	mg/kg/day	NA	mg/kg/day <sup>-1</sup>	---	5.6E-01	mg/kg/day	9.0E-01	mg/kg/day	6.2E-01			
				BENZENE	9.7E+00	ug/m3	3.3E-04	mg/kg/day	1.0E-01	mg/kg/day <sup>-1</sup>	3.3E-05	9.1E-04	mg/kg/day	8.6E-03	mg/kg/day	1.1E-01			
				CARBON TETRACHLORIDE	6.9E-01	ug/m3	2.3E-05	mg/kg/day	1.5E-01	mg/kg/day <sup>-1</sup>	3.5E-06	6.5E-05	mg/kg/day	1.1E-02	mg/kg/day	5.7E-03			
				CHLOROFORM	2.4E-01	ug/m3	8.2E-06	mg/kg/day	8.1E-02	mg/kg/day <sup>-1</sup>	6.6E-07	2.3E-05	mg/kg/day	8.6E-02	mg/kg/day	2.7E-04			
				DICHLORODIFLUOROMETHANE	3.1E+00	ug/m3	1.0E-04	mg/kg/day	NA	mg/kg/day <sup>-1</sup>	---	2.9E-04	mg/kg/day	5.7E-02	mg/kg/day	5.0E-03			
				ETHYLBENZENE	2.6E+01	ug/m3	8.6E-04	mg/kg/day	NA	mg/kg/day <sup>-1</sup>	---	2.4E-03	mg/kg/day	2.9E-01	mg/kg/day	8.4E-03			
				METHYLENE CHLORIDE	2.6E+02	ug/m3	8.6E-03	mg/kg/day	3.5E-03	mg/kg/day <sup>-1</sup>	3.0E-05	2.4E-02	mg/kg/day	1.1E-01	mg/kg/day	2.1E-01			
				TETRACHLOROETHENE	1.8E+01	ug/m3	6.2E-04	mg/kg/day	2.1E-02	mg/kg/day <sup>-1</sup>	1.3E-05	1.7E-03	mg/kg/day	1.0E-02	mg/kg/day	1.7E-01			
				TOLUENE	2.0E+03	ug/m3	6.6E-02	mg/kg/day	NA	mg/kg/day <sup>-1</sup>	---	1.9E-01	mg/kg/day	8.6E-02	mg/kg/day	2.2E+00			
				TRICHLOROETHENE	5.3E+00	ug/m3	1.8E-04	mg/kg/day	7.0E-03	mg/kg/day <sup>-1</sup>	1.2E-06	5.0E-04	mg/kg/day	1.7E-01	mg/kg/day	2.9E-03			
				TRICHLOROFLUOROMETHANE (FREON 11)	9.0E+00	ug/m3	3.0E-04	mg/kg/day	NA	mg/kg/day <sup>-1</sup>	---	8.4E-04	mg/kg/day	2.0E-01	mg/kg/day	4.2E-03			
				Exp. Route Total										8.1E-05					3.3E+00
				Exposure Point Total										8.1E-05					3.3E+00
Indoor Air Total										8.1E-05					3.3E+00				
Total of Receptor Risks Across All Media										8.2E-05	Total of Receptor Hazards Across All Media				3.4E+00				

ND: Not Detected. ---: Risk was not calculated for chemical.  
 NS: Not selected as an exposure pathway. mg/kg: milligram per kilogram.  
 na: The chemical is listed, value is not available. mg/kg/day: milligram per kilogram per day.  
 ne: The compound has not been evaluated by EPA for evidence of human carcinogenicity. mg/kg/day<sup>-1</sup>: milligram per kilogram-day.

TABLE A3-7.2B - Parcel North, RME  
 CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS  
 Reasonable Maximum Exposure  
 Omega Chemical Site - Whittier, California

Scenario Timeframe:	Current/Future
Receptor Population:	Industrial Worker
Receptor Age:	Adult

Cancer Intake		Noncancer Intake	
Surface Soil		Surface Soil	
Ingestion:	3.5E-07	Ingestion:	9.8E-07
Dermal:	2.3E-06	Dermal:	6.5E-06
Inhalation of soil vapor:	3.4E-02	Inhalation of soil vapor:	9.4E-02
Groundwater		Groundwater	
Inhalation of gw vapor:	3.4E-02	Inhalation of gw vapor:	9.4E-02

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations				Non-Cancer Hazard Calculations					
					Value	Units	Intake/ Exposure Concentration		CSF		Cancer Risk	Intake/ Exposure Concentration		RfD		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Indoor Air	Indoor Air	Indoor Air	Inhalation	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	3.9E+01	ug/m3	1.3E-03	mg/kg/day	NA	mg/kg/day <sup>-1</sup>	---	3.7E-03	mg/kg/day	NA	mg/kg/day	NA
				1,1-DICHLOROETHENE	8.7E+00	ug/m3	2.9E-04	mg/kg/day	NA	mg/kg/day <sup>-1</sup>	---	8.2E-04	mg/kg/day	5.7E-02	mg/kg/day	1.4E-02
				1,4-DICHLOROBENZENE	7.8E-01	ug/m3	2.6E-05	mg/kg/day	4.0E-02	mg/kg/day <sup>-1</sup>	1.0E-06	7.3E-05	mg/kg/day	2.3E-01	mg/kg/day	3.2E-04
				ACETONE	3.3E+03	ug/m3	1.1E-01	mg/kg/day	NA	mg/kg/day <sup>-1</sup>	---	3.1E-01	mg/kg/day	9.0E-01	mg/kg/day	3.5E-01
				BENZENE	1.1E+00	ug/m3	3.5E-05	mg/kg/day	1.0E-01	mg/kg/day <sup>-1</sup>	3.5E-06	9.9E-05	mg/kg/day	8.6E-03	mg/kg/day	1.2E-02
				CARBON TETRACHLORIDE	8.2E-01	ug/m3	2.7E-05	mg/kg/day	1.5E-01	mg/kg/day <sup>-1</sup>	4.1E-06	7.7E-05	mg/kg/day	1.1E-02	mg/kg/day	6.7E-03
				CHLOROFORM	3.4E-01	ug/m3	1.1E-05	mg/kg/day	8.1E-02	mg/kg/day <sup>-1</sup>	9.2E-07	3.2E-05	mg/kg/day	8.6E-02	mg/kg/day	3.7E-04
				DICHLORODIFLUOROMETHANE	3.0E+00	ug/m3	1.0E-04	mg/kg/day	NA	mg/kg/day <sup>-1</sup>	---	2.8E-04	mg/kg/day	5.7E-02	mg/kg/day	5.0E-03
				ETHYLBENZENE	8.2E-01	ug/m3	2.8E-05	mg/kg/day	NA	mg/kg/day <sup>-1</sup>	---	7.7E-05	mg/kg/day	2.9E-01	mg/kg/day	2.7E-04
				METHYLENE CHLORIDE	4.9E+00	ug/m3	1.6E-04	mg/kg/day	3.5E-03	mg/kg/day <sup>-1</sup>	5.7E-07	4.6E-04	mg/kg/day	1.1E-01	mg/kg/day	4.0E-03
				TETRACHLOROETHENE	2.2E+01	ug/m3	7.5E-04	mg/kg/day	2.1E-02	mg/kg/day <sup>-1</sup>	1.6E-05	2.1E-03	mg/kg/day	1.0E-02	mg/kg/day	2.1E-01
				TRICHLOROETHENE	1.3E+01	ug/m3	4.5E-04	mg/kg/day	7.0E-03	mg/kg/day <sup>-1</sup>	3.2E-06	1.3E-03	mg/kg/day	1.7E-01	mg/kg/day	7.4E-03
				TRICHLOROFLUOROMETHANE (FREON 11)	1.1E+01	ug/m3	3.8E-04	mg/kg/day	NA	mg/kg/day <sup>-1</sup>	---	1.1E-03	mg/kg/day	2.0E-01	mg/kg/day	5.3E-03
				Exp. Route Total										2.9E-05		
Exposure Point Total										2.9E-05						6.1E-01
Indoor Air Total										2.9E-05					6.1E-01	
Total of Receptor Risks Across All Media										2.9E-05	Total of Receptor Hazards Across All Media				6.1E-01	

ND: Not Detected.  
 NS: Not selected as an exposure pathway.  
 na: The chemical is listed, value is not available.  
 ne: The compound has not been evaluated by EPA for evidence of human carcinogenicity.

---: Risk was not calculated for chemical.  
 mg/kg: milligram per kilogram.  
 mg/kg/day: milligram per kilogram per day.  
 mg/kg/day<sup>-1</sup>: milligram per kilogram-day.

TABLE A3-7.2C - Parcel West, RME  
 CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS  
 Reasonable Maximum Exposure  
 Omega Chemical Site - Whittier, California

Scenario Timeframe:	Current/Future
Receptor Population:	Industrial Worker
Receptor Age:	Adult

Cancer Intake		Noncancer Intake	
Surface Soil		Surface Soil	
Ingestion:	3.5E-07	Ingestion:	9.8E-07
Dermal:	2.3E-06	Dermal:	6.5E-06
Inhalation of soil vapor:	3.4E-02	Inhalation of soil vapor:	9.4E-02
Groundwater		Groundwater	
Inhalation of gw vapor:	3.4E-02	Inhalation of gw vapor:	9.4E-02

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations				Non-Cancer Hazard Calculations					
					Value	Units	Intake/ Exposure Concentration		CSF	Cancer Risk	Intake/ Exposure Concentration		RFD		Hazard Quotient	
							Value	Units			Value	Units	Value	Units		
Indoor Air	Indoor Air	Indoor Air	Inhalation	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	2.6E+01	ug/m3	8.7E-04	mg/kg/day	NA	mg/kg/day <sup>-1</sup>	---	2.4E-03	mg/kg/day	NA	mg/kg/day	NA
				1,1-DICHLOROETHENE	2.3E+01	ug/m3	7.6E-04	mg/kg/day	NA	mg/kg/day <sup>-1</sup>	---	2.1E-03	mg/kg/day	5.7E-02	mg/kg/day	3.7E-02
				1,4-DICHLOROBENZENE	3.0E-01	ug/m3	1.0E-05	mg/kg/day	4.0E-02	mg/kg/day <sup>-1</sup>	4.0E-07	2.8E-05	mg/kg/day	2.3E-01	mg/kg/day	1.2E-04
				ACETONE	4.3E+01	ug/m3	1.4E-03	mg/kg/day	NA	mg/kg/day <sup>-1</sup>	---	4.0E-03	mg/kg/day	9.0E-01	mg/kg/day	4.5E-03
				BENZENE	1.4E+00	ug/m3	4.8E-05	mg/kg/day	1.0E-01	mg/kg/day <sup>-1</sup>	4.8E-06	1.4E-04	mg/kg/day	8.6E-03	mg/kg/day	1.6E-02
				CARBON TETRACHLORIDE	6.9E-01	ug/m3	2.3E-05	mg/kg/day	1.5E-01	mg/kg/day <sup>-1</sup>	3.5E-06	6.5E-05	mg/kg/day	1.1E-02	mg/kg/day	5.7E-03
				CHLOROFORM	2.4E-01	ug/m3	8.2E-06	mg/kg/day	8.1E-02	mg/kg/day <sup>-1</sup>	6.6E-07	2.3E-05	mg/kg/day	8.6E-02	mg/kg/day	2.7E-04
				DICHLORODIFLUOROMETHANE	2.9E+00	ug/m3	9.6E-05	mg/kg/day	NA	mg/kg/day <sup>-1</sup>	---	2.7E-04	mg/kg/day	5.7E-02	mg/kg/day	4.7E-03
				ETHYLBENZENE	1.6E+00	ug/m3	5.2E-05	mg/kg/day	NA	mg/kg/day <sup>-1</sup>	---	1.5E-04	mg/kg/day	2.9E-01	mg/kg/day	5.1E-04
				METHYLENE CHLORIDE	1.5E+00	ug/m3	5.0E-05	mg/kg/day	3.5E-03	mg/kg/day <sup>-1</sup>	1.7E-07	1.4E-04	mg/kg/day	1.1E-01	mg/kg/day	1.2E-03
				TETRACHLOROETHENE	1.0E+02	ug/m3	3.4E-03	mg/kg/day	2.1E-02	mg/kg/day <sup>-1</sup>	7.0E-05	9.6E-03	mg/kg/day	1.0E-02	mg/kg/day	9.6E-01
				TRICHLOROETHENE	4.3E+00	ug/m3	1.4E-04	mg/kg/day	7.0E-03	mg/kg/day <sup>-1</sup>	1.0E-06	4.0E-04	mg/kg/day	1.7E-01	mg/kg/day	2.4E-03
				TRICHLOROFLUOROMETHANE (FREON 11)	6.7E+00	ug/m3	2.3E-04	mg/kg/day	NA	mg/kg/day <sup>-1</sup>	---	6.3E-04	mg/kg/day	2.0E-01	mg/kg/day	3.2E-03
				Exp. Route Total										8.1E-05		
Exposure Point Total										8.1E-05						1.0E+00
Indoor Air Total										8.1E-05					1.0E+00	
Total of Receptor Risks Across All Media										8.1E-05	Total of Receptor Hazards Across All Media				1.0E+00	

ND: Not Detected.  
 NS: Not selected as an exposure pathway.  
 na: The chemical is listed, value is not available.  
 ne: The compound has not been evaluated by EPA for evidence of human carcinogenicity.

---: Risk was not calculated for chemical.  
 mg/kg: milligram per kilogram.  
 mg/kg/day: milligram per kilogram per day.  
 mg/kg/day<sup>-1</sup>: milligram per kilogram-day.

TABLE A3-7.2D - Parcel South - Bishop, RME  
 CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS  
 Reasonable Maximum Exposure  
 Omega Chemical Site - Whittier, California

Scenario Timeframe:	Current/Future
Receptor Population:	Industrial Worker
Receptor Age:	Adult

Cancer Intake		Noncancer Intake	
Surface Soil		Surface Soil	
Ingestion:	3.5E-07	Ingestion:	9.8E-07
Dermal:	2.3E-06	Dermal:	6.5E-06
Inhalation of soil vapor:	3.4E-02	Inhalation of soil vapor:	9.4E-02
Groundwater		Groundwater	
Inhalation of gw vapor:	3.4E-02	Inhalation of gw vapor:	9.4E-02

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations							
					Value	Units	Intake/ Exposure Concentration		CSF		Cancer Risk	Intake/ Exposure Concentration		RfD		Hazard Quotient			
							Value	Units	Value	Units		Value	Units	Value	Units				
Indoor Air	Indoor Air	Indoor Air	Inhalation	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	1.0E+01	ug/m3	3.3E-04	mg/kg/day	NA	mg/kg/day <sup>-1</sup>	---	9.4E-04	mg/kg/day	NA	mg/kg/day	NA			
				1,1-DICHLOROETHENE	1.4E+01	ug/m3	4.8E-04	mg/kg/day	NA	mg/kg/day <sup>-1</sup>	---	1.3E-03	mg/kg/day	5.7E-02	mg/kg/day	2.4E-02			
				1,4-DICHLOROBENZENE	3.2E-01	ug/m3	1.1E-05	mg/kg/day	4.0E-02	mg/kg/day <sup>-1</sup>	4.3E-07	3.0E-05	mg/kg/day	2.3E-01	mg/kg/day	1.3E-04			
				ACETONE	4.1E+01	ug/m3	1.4E-03	mg/kg/day	NA	mg/kg/day <sup>-1</sup>	---	3.9E-03	mg/kg/day	9.0E-01	mg/kg/day	4.3E-03			
				BENZENE	1.3E+00	ug/m3	4.2E-05	mg/kg/day	1.0E-01	mg/kg/day <sup>-1</sup>	4.2E-06	1.2E-04	mg/kg/day	8.6E-03	mg/kg/day	1.4E-02			
				CARBON TETRACHLORIDE	5.7E-01	ug/m3	1.9E-05	mg/kg/day	1.5E-01	mg/kg/day <sup>-1</sup>	2.9E-06	5.4E-05	mg/kg/day	1.1E-02	mg/kg/day	4.7E-03			
				CHLOROFORM	1.8E-01	ug/m3	5.9E-06	mg/kg/day	8.1E-02	mg/kg/day <sup>-1</sup>	4.7E-07	1.7E-05	mg/kg/day	8.6E-02	mg/kg/day	1.9E-04			
				DICHLORODIFLUOROMETHANE	3.0E+00	ug/m3	1.0E-04	mg/kg/day	NA	mg/kg/day <sup>-1</sup>	---	2.8E-04	mg/kg/day	5.7E-02	mg/kg/day	4.9E-03			
				ETHYLBENZENE	1.7E+00	ug/m3	5.8E-05	mg/kg/day	NA	mg/kg/day <sup>-1</sup>	---	1.6E-04	mg/kg/day	2.9E-01	mg/kg/day	5.7E-04			
				METHYLENE CHLORIDE	1.7E+00	ug/m3	5.7E-05	mg/kg/day	3.5E-03	mg/kg/day <sup>-1</sup>	2.0E-07	1.6E-04	mg/kg/day	1.1E-01	mg/kg/day	1.4E-03			
				TETRACHLOROETHENE	2.9E+01	ug/m3	9.8E-04	mg/kg/day	2.1E-02	mg/kg/day <sup>-1</sup>	2.0E-05	2.7E-03	mg/kg/day	1.0E-02	mg/kg/day	2.7E-01			
				TRICHLOROFLUOROMETHANE (FREON 11)	3.7E+00	ug/m3	1.2E-04	mg/kg/day	NA	mg/kg/day <sup>-1</sup>	---	3.4E-04	mg/kg/day	2.0E-01	mg/kg/day	1.7E-03			
				Exp. Route Total															
Exposure Point Total																	2.8E-05		3.3E-01
Indoor Air Total																	2.8E-05		3.3E-01
										Total of Receptor Risks Across All Media		2.8E-05	Total of Receptor Hazards Across All Media					3.3E-01	

ND: Not Detected.  
 NS: Not selected as an exposure pathway.  
 na: The chemical is listed, value is not available.  
 ne: The compound has not been evaluated by EPA for evidence of human carcinogenicity.

---: Risk was not calculated for chemical.  
 mg/kg: milligram per kilogram.  
 mg/kg/day: milligram per kilogram per day.  
 mg/kg/day<sup>-1</sup>: milligram per kilogram-day.

TABLE A3-7.2E - Parcel South - LA Carts/Oncology Care, RME  
 CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS  
 Reasonable Maximum Exposure  
 Omega Chemical Site - Whittier, California

Scenario Timeframe:	Current/Future
Receptor Population:	Industrial Worker
Receptor Age:	Adult

Cancer Intake		Noncancer Intake	
Surface Soil		Surface Soil	
Ingestion:	3.5E-07	Ingestion:	9.8E-07
Dermal:	2.3E-06	Dermal:	6.5E-06
Inhalation of soil vapor:	3.4E-02	Inhalation of soil vapor:	9.4E-02
Groundwater		Groundwater	
Inhalation of gw vapor:	3.4E-02	Inhalation of gw vapor:	9.4E-02

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations				Non-Cancer Hazard Calculations					
					Value	Units	Intake/ Exposure Concentration		CSF		Cancer Risk	Intake/ Exposure Concentration		RfD		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Indoor Air	Indoor Air	Indoor Air	Inhalation	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	1.1E+01	ug/m3	3.7E-04	mg/kg/day	NA	mg/kg/day <sup>-1</sup>	---	1.0E-03	mg/kg/day	NA	mg/kg/day	NA
				1,1-DICHLOROETHENE	2.9E+00	ug/m3	9.7E-05	mg/kg/day	NA	mg/kg/day <sup>-1</sup>	---	2.7E-04	mg/kg/day	5.7E-02	mg/kg/day	4.8E-03
				1,2-DICHLOROETHANE	3.1E-01	ug/m3	1.0E-05	mg/kg/day	9.1E-02	mg/kg/day <sup>-1</sup>	9.5E-07	2.9E-05	mg/kg/day	1.4E-03	mg/kg/day	2.1E-02
				1,4-DICHLOROBENZENE	3.9E-01	ug/m3	1.3E-05	mg/kg/day	4.0E-02	mg/kg/day <sup>-1</sup>	5.2E-07	3.7E-05	mg/kg/day	2.3E-01	mg/kg/day	1.6E-04
				ACETONE	1.2E+03	ug/m3	3.9E-02	mg/kg/day	NA	mg/kg/day <sup>-1</sup>	---	1.1E-01	mg/kg/day	9.0E-01	mg/kg/day	1.2E-01
				BENZENE	1.9E+00	ug/m3	6.4E-05	mg/kg/day	1.0E-01	mg/kg/day <sup>-1</sup>	6.4E-06	1.8E-04	mg/kg/day	8.6E-03	mg/kg/day	2.1E-02
				CARBON TETRACHLORIDE	5.2E-01	ug/m3	1.7E-05	mg/kg/day	1.5E-01	mg/kg/day <sup>-1</sup>	2.6E-06	4.8E-05	mg/kg/day	1.1E-02	mg/kg/day	4.3E-03
				CHLOROFORM	6.3E-01	ug/m3	2.1E-05	mg/kg/day	8.1E-02	mg/kg/day <sup>-1</sup>	1.7E-06	6.0E-05	mg/kg/day	8.6E-02	mg/kg/day	7.0E-04
				DICHLORODIFLUOROMETHANE	3.3E+00	ug/m3	1.1E-04	mg/kg/day	NA	mg/kg/day <sup>-1</sup>	---	3.1E-04	mg/kg/day	5.7E-02	mg/kg/day	5.4E-03
				ETHYLBENZENE	1.8E+00	ug/m3	6.1E-05	mg/kg/day	NA	mg/kg/day <sup>-1</sup>	---	1.7E-04	mg/kg/day	2.9E-01	mg/kg/day	6.0E-04
				METHYLENE CHLORIDE	5.4E+00	ug/m3	1.8E-04	mg/kg/day	3.5E-03	mg/kg/day <sup>-1</sup>	6.3E-07	5.1E-04	mg/kg/day	1.1E-01	mg/kg/day	4.4E-03
				TETRACHLOROETHENE	1.6E+00	ug/m3	5.5E-05	mg/kg/day	2.1E-02	mg/kg/day <sup>-1</sup>	1.1E-06	1.5E-04	mg/kg/day	1.0E-02	mg/kg/day	1.5E-02
				TOLUENE	5.7E+02	ug/m3	1.9E-02	mg/kg/day	NA	mg/kg/day <sup>-1</sup>	---	5.3E-02	mg/kg/day	8.6E-02	mg/kg/day	6.2E-01
				TRICHLOROFLUOROMETHANE (FREON 11)	3.0E+00	ug/m3	1.0E-04	mg/kg/day	NA	mg/kg/day <sup>-1</sup>	---	2.8E-04	mg/kg/day	2.0E-01	mg/kg/day	1.4E-03
				Exp. Route Total										1.4E-05		
Exposure Point Total										1.4E-05						8.2E-01
Indoor Air Total										1.4E-05						8.2E-01
Total of Receptor Risks Across All Media										1.4E-05	Total of Receptor Hazards Across All Media				8.2E-01	

ND: Not Detected.  
 NS: Not selected as an exposure pathway.  
 na: The chemical is listed, value is not available.  
 ne: The compound has not been evaluated by EPA for evidence of human carcinogenicity.

---: Risk was not calculated for chemical.  
 mg/kg: milligram per kilogram.  
 mg/kg/day: milligram per kilogram per day.  
 mg/kg/day<sup>-1</sup>: milligram per kilogram-day.

TABLE A3-7.2F - Parcel South, RME  
 CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS  
 Reasonable Maximum Exposure  
 Omega Chemical Site - Whittier, California

Scenario Timeframe:	Current/Future
Receptor Population:	Industrial Worker
Receptor Age:	Adult

Cancer Intake		Noncancer Intake	
Surface Soil		Surface Soil	
Ingestion:	3.5E-07	Ingestion:	9.8E-07
Dermal:	2.3E-06	Dermal:	6.5E-06
Inhalation of soil vapor:	3.4E-02	Inhalation of soil vapor:	9.4E-02
Groundwater		Groundwater	
Inhalation of gw vapor:	3.4E-02	Inhalation of gw vapor:	9.4E-02

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations									
					Value	Units	Intake/ Exposure Concentration		CSF		Cancer Risk	Intake/ Exposure Concentration		RfD		Hazard Quotient					
							Value	Units	Value	Units		Value	Units	Value	Units						
Soil Gas	Indoor Air	Indoor Air	Inhalation	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	6.4E+02	ug/m3	2.2E-02	mg/kg/day	NA	mg/kg/day <sup>-1</sup>	---	6.1E-02	mg/kg/day	NA	mg/kg/day	NA					
				1,1-DICHLOROETHENE	2.4E+02	ug/m3	7.9E-03	mg/kg/day	NA	mg/kg/day <sup>-1</sup>	---	2.2E-02	mg/kg/day	5.7E-02	mg/kg/day	3.9E-01					
				1,2,4-TRIMETHYLBENZENE	3.1E-03	ug/m3	1.0E-07	mg/kg/day	NA	mg/kg/day <sup>-1</sup>	---	2.9E-07	mg/kg/day	1.7E-03	mg/kg/day	1.7E-04					
				2,2,4-TRIMETHYLPENTANE	NA	ug/m3	---	mg/kg/day	NA	mg/kg/day <sup>-1</sup>	---	---	mg/kg/day	NA	mg/kg/day	NA					
				2-BUTANONE	2.1E-03	ug/m3	7.0E-08	mg/kg/day	NA	mg/kg/day <sup>-1</sup>	---	2.0E-07	mg/kg/day	1.4E+00	mg/kg/day	1.4E-07					
				4-ETHYLTOLUENE	NA	ug/m3	---	mg/kg/day	NA	mg/kg/day <sup>-1</sup>	---	---	mg/kg/day	NA	mg/kg/day	NA					
				ACETONE	6.8E-02	ug/m3	2.3E-06	mg/kg/day	NA	mg/kg/day <sup>-1</sup>	---	6.4E-06	mg/kg/day	9.0E-01	mg/kg/day	7.1E-06					
				CARBON DISULFIDE	3.5E-03	ug/m3	1.2E-07	mg/kg/day	NA	mg/kg/day <sup>-1</sup>	---	3.3E-07	mg/kg/day	2.0E-01	mg/kg/day	1.7E-06					
				CHLOROFORM	3.9E-03	ug/m3	1.3E-07	mg/kg/day	8.1E-02	mg/kg/day <sup>-1</sup>	1.0E-08	3.6E-07	mg/kg/day	8.6E-02	mg/kg/day	4.2E-06					
				DICHLORODIFLUOROMETHANE	2.1E+00	ug/m3	7.1E-05	mg/kg/day	NA	mg/kg/day <sup>-1</sup>	---	2.0E-04	mg/kg/day	5.7E-02	mg/kg/day	3.5E-03					
				HEXANE (N-HEXANE)	5.1E-03	ug/m3	1.7E-07	mg/kg/day	NA	mg/kg/day <sup>-1</sup>	---	4.8E-07	mg/kg/day	2.0E-01	mg/kg/day	2.4E-06					
				TETRACHLOROETHENE	1.9E+01	ug/m3	6.3E-04	mg/kg/day	2.1E-02	mg/kg/day <sup>-1</sup>	1.3E-05	1.8E-03	mg/kg/day	1.0E-02	mg/kg/day	1.8E-01					
				TRICHLOROETHENE	1.1E+01	ug/m3	3.6E-04	mg/kg/day	7.0E-03	mg/kg/day <sup>-1</sup>	2.5E-06	1.0E-03	mg/kg/day	1.7E-01	mg/kg/day	5.9E-03					
				TRICHLOROFLUOROMETHANE (FREON 11)	1.5E+02	ug/m3	4.9E-03	mg/kg/day	NA	mg/kg/day <sup>-1</sup>	---	1.4E-02	mg/kg/day	2.0E-01	mg/kg/day	6.9E-02					
				Exp. Route Total																1.6E-05	
Exposure Point Total																				6.5E-01	
Soil Gas Total																			1.6E-05	6.5E-01	
										Total of Receptor Risks Across All Media					Total of Receptor Hazards Across All Media					1.6E-05	6.5E-01

ND: Not Detected.  
 NS: Not selected as an exposure pathway.  
 na: The chemical is listed, value is not available.  
 ne: The compound has not been evaluated by EPA for evidence of human carcinogenicity.

---: Risk was not calculated for chemical.  
 mg/kg: milligram per kilogram.  
 mg/kg/day: milligram per kilogram per day.  
 mg/kg/day<sup>-1</sup>: milligram per kilogram-day.

TABLE A3-7.3A - Parcel Site, CTE  
 CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS

Central Tendency Exposure  
 Omega Chemical Site - Whittier, California

Scenario Timeframe:	Current/Future
Receptor Population:	Construction Worker - CTE
Receptor Age:	Adult

Cancer Intake		Noncancer Intake	
Surface Soil		Surface Soil	
Ingestion:	3.4E-09	Ingestion:	2.3E-07
Dermal:	4.1E-08	Dermal:	2.9E-06
Inhalation of fugitive dust:	6.2E-13	Inhalation of fugitive dust:	4.3E-11

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/ Exposure Concentration		CSF		Cancer Risk	Intake/ Exposure Concentration		RfD		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Soil	Surface and Subsurface Soil to 30' bgs	Surface and Subsurface Soil	Ingestion	1,1,1-TRICHLOROETHANE	2.6E+02	mg/kg	8.9E-07	mg/kg/day	NA	mg/kg/day <sup>-1</sup>	---	6.2E-05	mg/kg/day	2.8E-01	mg/kg/day	2.2E-04
				1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	1.3E+02	mg/kg	4.2E-07	mg/kg/day	NA	mg/kg/day <sup>-1</sup>	---	2.9E-05	mg/kg/day	3.0E-01	mg/kg/day	9.8E-05
				1,1-DICHLOROETHENE	1.3E+01	mg/kg	4.2E-08	mg/kg/day	NA	mg/kg/day <sup>-1</sup>	---	3.0E-06	mg/kg/day	5.0E-02	mg/kg/day	5.9E-05
				1,2-DICHLOROETHANE	1.6E+00	mg/kg	5.4E-09	mg/kg/day	9.1E-02	mg/kg/day <sup>-1</sup>	4.9E-10	3.8E-07	mg/kg/day	2.0E-02	mg/kg/day	1.9E-05
				1,4-DIOXANE	1.6E+01	mg/kg	5.4E-08	mg/kg/day	2.7E-02	mg/kg/day <sup>-1</sup>	1.4E-09	3.7E-06	mg/kg/day	NA	mg/kg/day	NA
				2-METHYLNAPHTHALENE	5.4E-01	mg/kg	1.8E-09	mg/kg/day	NA	mg/kg/day <sup>-1</sup>	---	1.3E-07	mg/kg/day	4.0E-03	mg/kg/day	3.2E-05
				BENZO(A)ANTHRACENE	2.1E+00	mg/kg	7.0E-09	mg/kg/day	1.2E+00	mg/kg/day <sup>-1</sup>	8.4E-09	4.9E-07	mg/kg/day	NA	mg/kg/day	NA
				BENZO(A)PYRENE	1.6E+00	mg/kg	5.4E-09	mg/kg/day	1.2E+01	mg/kg/day <sup>-1</sup>	6.4E-08	3.8E-07	mg/kg/day	NA	mg/kg/day	NA
				BENZO(B)FLUORANTHENE	9.1E-01	mg/kg	3.1E-09	mg/kg/day	1.2E+00	mg/kg/day <sup>-1</sup>	3.7E-09	2.1E-07	mg/kg/day	NA	mg/kg/day	NA
				BIS(2-ETHYLHEXYL)PHTHALATE	1.5E+01	mg/kg	5.1E-08	mg/kg/day	1.4E-02	mg/kg/day <sup>-1</sup>	7.2E-10	3.6E-06	mg/kg/day	2.0E-02	mg/kg/day	1.8E-04
				CHROMIUM	7.7E+01	mg/kg	2.6E-07	mg/kg/day	NA	mg/kg/day <sup>-1</sup>	---	1.8E-05	mg/kg/day	1.5E+00	mg/kg/day	1.2E-05
				CHROMIUM VI	1.1E+01	mg/kg	3.7E-08	mg/kg/day	NA	mg/kg/day <sup>-1</sup>	---	2.6E-06	mg/kg/day	3.0E-03	mg/kg/day	8.6E-04
				DIELDRIN	3.5E-02	mg/kg	1.2E-10	mg/kg/day	1.6E+01	mg/kg/day <sup>-1</sup>	1.9E-09	8.2E-09	mg/kg/day	5.0E-05	mg/kg/day	1.6E-04
				IRON	2.3E+04	mg/kg	7.8E-05	mg/kg/day	NA	mg/kg/day <sup>-1</sup>	---	5.4E-03	mg/kg/day	3.0E-01	mg/kg/day	1.8E-02
				LEAD	5.4E+01	mg/kg	1.8E-07	mg/kg/day	8.5E-03	mg/kg/day <sup>-1</sup>	1.5E-09	1.3E-05	mg/kg/day	NA	mg/kg/day	NA
				METHYLENE CHLORIDE	2.1E+01	mg/kg	7.1E-08	mg/kg/day	1.4E-02	mg/kg/day <sup>-1</sup>	1.0E-09	5.0E-06	mg/kg/day	6.0E-02	mg/kg/day	8.3E-05
				NAPHTHALENE	9.9E-01	mg/kg	3.3E-09	mg/kg/day	1.2E-01	mg/kg/day <sup>-1</sup>	4.0E-10	2.3E-07	mg/kg/day	2.0E-02	mg/kg/day	1.2E-05
				PCB-1254 (AROCOR 1254)	8.1E-02	mg/kg	2.7E-10	mg/kg/day	5.0E+00	mg/kg/day <sup>-1</sup>	1.4E-09	1.9E-08	mg/kg/day	2.0E-05	mg/kg/day	9.6E-04
				PHENANTHRENE	2.4E+00	mg/kg	8.0E-09	mg/kg/day	NA	mg/kg/day <sup>-1</sup>	---	5.6E-07	mg/kg/day	NA	mg/kg/day	NA
				TETRACHLOROETHENE	3.2E+02	mg/kg	1.1E-06	mg/kg/day	5.4E-01	mg/kg/day <sup>-1</sup>	5.8E-07	7.5E-05	mg/kg/day	1.0E-02	mg/kg/day	7.5E-03
				TOLUENE	1.3E+01	mg/kg	4.4E-08	mg/kg/day	NA	mg/kg/day <sup>-1</sup>	---	3.1E-06	mg/kg/day	8.0E-02	mg/kg/day	3.8E-05
TRICHLOROETHENE	3.0E+01	mg/kg	1.0E-07	mg/kg/day	1.3E-02	mg/kg/day <sup>-1</sup>	1.3E-09	7.1E-06	mg/kg/day	3.0E-04	mg/kg/day	2.4E-02				
TRICHLOROFLUOROMETHANE (FREON 11)	4.7E+01	mg/kg	1.6E-07	mg/kg/day	NA	mg/kg/day <sup>-1</sup>	---	1.1E-05	mg/kg/day	3.0E-01	mg/kg/day	3.7E-05				
Exp. Route Total										6.62E-07					5.2E-02	

TABLE A3-7.3A - Parcel Site, CTE  
 CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS

Central Tendency Exposure  
 Omega Chemical Site - Whittier, California

Scenario Timeframe:	Current/Future
Receptor Population:	Construction Worker - CTE
Receptor Age:	Adult

Cancer Intake		Noncancer Intake	
Surface Soil		Surface Soil	
Ingestion:	3.4E-09	Ingestion:	2.3E-07
Dermal:	4.1E-08	Dermal:	2.9E-06
Inhalation of fugitive dust:	6.2E-13	Inhalation of fugitive dust:	4.3E-11

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/ Exposure Concentration		CSF		Cancer Risk	Intake/ Exposure Concentration		RfD		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
			Dermal	1,1,1-TRICHLOROETHANE	2.6E+02	mg/kg	1.1E-05	mg/kg/day	NA	mg/kg/day <sup>-1</sup>	---	7.6E-04	mg/kg/day	2.8E+00	mg/kg/day	2.7E-04
				1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	1.3E+02	mg/kg	5.1E-06	mg/kg/day	NA	mg/kg/day <sup>-1</sup>	---	3.6E-04	mg/kg/day	3.0E+00	mg/kg/day	1.2E-04
				1,1-DICHLOROETHENE	1.3E+01	mg/kg	5.2E-07	mg/kg/day	NA	mg/kg/day <sup>-1</sup>	---	3.6E-05	mg/kg/day	5.0E-01	mg/kg/day	7.2E-05
				1,2-DICHLOROETHANE	1.6E+00	mg/kg	6.6E-08	mg/kg/day	9.1E-03	mg/kg/day <sup>-1</sup>	6.0E-10	4.6E-06	mg/kg/day	2.0E-01	mg/kg/day	2.3E-05
				1,4-DIOXANE	1.6E+01	mg/kg	6.5E-07	mg/kg/day	8.1E-04	mg/kg/day <sup>-1</sup>	5.3E-10	4.6E-05	mg/kg/day	NA	mg/kg/day	NA
				2-METHYLNAPHTHALENE	5.4E-01	mg/kg	2.2E-08	mg/kg/day	NA	mg/kg/day <sup>-1</sup>	---	1.5E-06	mg/kg/day	4.0E-02	mg/kg/day	3.9E-05
				BENZO(A)ANTHRACENE	2.1E+00	mg/kg	8.5E-08	mg/kg/day	1.8E-01	mg/kg/day <sup>-1</sup>	1.5E-08	6.0E-06	mg/kg/day	NA	mg/kg/day	NA
				BENZO(A)PYRENE	1.6E+00	mg/kg	6.6E-08	mg/kg/day	1.8E+00	mg/kg/day <sup>-1</sup>	1.2E-07	4.6E-06	mg/kg/day	NA	mg/kg/day	NA
				BENZO(B)FLUORANTHENE	9.1E-01	mg/kg	3.7E-08	mg/kg/day	1.8E-01	mg/kg/day <sup>-1</sup>	6.7E-09	2.6E-06	mg/kg/day	NA	mg/kg/day	NA
				BIS(2-ETHYLHEXYL)PHTHALATE	1.5E+01	mg/kg	6.3E-07	mg/kg/day	1.4E-03	mg/kg/day <sup>-1</sup>	8.8E-10	4.4E-05	mg/kg/day	2.0E-01	mg/kg/day	2.2E-04
				CHROMIUM	7.7E+01	mg/kg	3.2E-06	mg/kg/day	NA	mg/kg/day <sup>-1</sup>	---	2.2E-04	mg/kg/day	1.5E+02	mg/kg/day	1.5E-06
				CHROMIUM VI	1.1E+01	mg/kg	4.5E-07	mg/kg/day	NA	mg/kg/day <sup>-1</sup>	---	3.2E-05	mg/kg/day	NA	mg/kg/day	NA
				DIELDRIN	3.5E-02	mg/kg	1.4E-09	mg/kg/day	8.0E-01	mg/kg/day <sup>-1</sup>	1.1E-09	1.0E-07	mg/kg/day	1.0E-03	mg/kg/day	1.0E-04
				IRON	2.3E+04	mg/kg	9.5E-04	mg/kg/day	NA	mg/kg/day <sup>-1</sup>	---	6.7E-02	mg/kg/day	3.0E+01	mg/kg/day	2.2E-03
				LEAD	5.4E+01	mg/kg	2.2E-06	mg/kg/day	8.5E-05	mg/kg/day <sup>-1</sup>	1.9E-10	1.5E-04	mg/kg/day	NA	mg/kg/day	NA
				METHYLENE CHLORIDE	2.1E+01	mg/kg	8.7E-07	mg/kg/day	1.4E-03	mg/kg/day <sup>-1</sup>	1.2E-09	6.1E-05	mg/kg/day	6.0E-01	mg/kg/day	1.0E-04
				NAPHTHALENE	9.9E-01	mg/kg	4.1E-08	mg/kg/day	1.8E-02	mg/kg/day <sup>-1</sup>	7.3E-10	2.8E-06	mg/kg/day	1.3E-01	mg/kg/day	2.1E-05
				PCB-1254 (AROCOR 1254)	8.1E-02	mg/kg	3.3E-09	mg/kg/day	7.5E-01	mg/kg/day <sup>-1</sup>	2.5E-09	2.3E-07	mg/kg/day	1.3E-04	mg/kg/day	1.8E-03
				PHENANTHRENE	2.4E+00	mg/kg	9.8E-08	mg/kg/day	NA	mg/kg/day <sup>-1</sup>	---	6.8E-06	mg/kg/day	NA	mg/kg/day	NA
				TETRACHLOROETHENE	3.2E+02	mg/kg	1.3E-05	mg/kg/day	5.4E-02	mg/kg/day <sup>-1</sup>	7.0E-07	9.1E-04	mg/kg/day	1.0E-01	mg/kg/day	9.1E-03
				TOLUENE	1.3E+01	mg/kg	5.4E-07	mg/kg/day	NA	mg/kg/day <sup>-1</sup>	---	3.8E-05	mg/kg/day	8.0E-01	mg/kg/day	4.7E-05
				TRICHLOROETHENE	3.0E+01	mg/kg	1.2E-06	mg/kg/day	1.3E-03	mg/kg/day <sup>-1</sup>	1.6E-09	8.7E-05	mg/kg/day	3.0E-03	mg/kg/day	2.9E-02
				TRICHLOROFLUOROMETHANE (FREON 11)	4.7E+01	mg/kg	1.9E-06	mg/kg/day	NA	mg/kg/day <sup>-1</sup>	---	1.4E-04	mg/kg/day	3.0E+00	mg/kg/day	4.5E-05
			Exp. Route Total								8.52E-07					4.3E-02
			Exposure Point Total								1.51E-06					9.5E-02

TABLE A3-7.3A - Parcel Site, CTE  
 CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS

Central Tendency Exposure  
 Omega Chemical Site - Whittier, California

Scenario Timeframe:	Current/Future
Receptor Population:	Construction Worker - CTE
Receptor Age:	Adult

Cancer Intake		Noncancer Intake	
Surface Soil		Surface Soil	
Ingestion:	3.4E-09	Ingestion:	2.3E-07
Dermal:	4.1E-08	Dermal:	2.9E-06
Inhalation of fugitive dust:	6.2E-13	Inhalation of fugitive dust:	4.3E-11

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations					
					Value	Units	Intake/ Exposure Concentration		CSF		Cancer Risk	Intake/ Exposure Concentration		RfD		Hazard Quotient	
							Value	Units	Value	Units		Value	Units	Value	Units		
		Fugitive Dust	Inhalation	1,1,1-TRICHLOROETHANE	2.6E+02	mg/kg	1.6E-10	mg/kg/day	NA	mg/kg/day <sup>-1</sup>	---	1.1E-08	mg/kg/day	2.8E+00	mg/kg/day	4.1E-09	
				1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	1.3E+02	mg/kg	7.7E-11	mg/kg/day	NA	mg/kg/day <sup>-1</sup>	---	5.4E-09	mg/kg/day	3.0E+00	mg/kg/day	1.8E-09	
				1,1-DICHLOROETHENE	1.3E+01	mg/kg	7.8E-12	mg/kg/day	NA	mg/kg/day <sup>-1</sup>	---	5.5E-10	mg/kg/day	5.0E-01	mg/kg/day	1.1E-09	
				1,2-DICHLOROETHANE	1.6E+00	mg/kg	9.9E-13	mg/kg/day	9.1E-03	mg/kg/day <sup>-1</sup>	9.0E-15	6.9E-11	mg/kg/day	2.0E-01	mg/kg/day	3.5E-10	
				1,4-DIOXANE	1.6E+01	mg/kg	9.8E-12	mg/kg/day	8.1E-04	mg/kg/day <sup>-1</sup>	8.0E-15	6.9E-10	mg/kg/day	NA	mg/kg/day	NA	
				2-METHYLNAPHTHALENE	5.4E-01	mg/kg	3.3E-13	mg/kg/day	NA	mg/kg/day <sup>-1</sup>	---	2.3E-11	mg/kg/day	4.0E-02	mg/kg/day	5.8E-10	
				BENZO(A)ANTHRACENE	2.1E+00	mg/kg	1.3E-12	mg/kg/day	1.8E-01	mg/kg/day <sup>-1</sup>	2.3E-13	9.0E-11	mg/kg/day	NA	mg/kg/day	NA	
				BENZO(A)PYRENE	1.6E+00	mg/kg	9.9E-13	mg/kg/day	1.8E+00	mg/kg/day <sup>-1</sup>	1.8E-12	6.9E-11	mg/kg/day	NA	mg/kg/day	NA	
				BENZO(B)FLUORANTHENE	9.1E-01	mg/kg	5.6E-13	mg/kg/day	1.8E-01	mg/kg/day <sup>-1</sup>	1.0E-13	3.9E-11	mg/kg/day	NA	mg/kg/day	NA	
				BIS(2-ETHYLHEXYL)PHTHALATE	1.5E+01	mg/kg	9.4E-12	mg/kg/day	1.4E-03	mg/kg/day <sup>-1</sup>	1.3E-14	6.6E-10	mg/kg/day	2.0E-01	mg/kg/day	3.3E-09	
				CHROMIUM	7.7E+01	mg/kg	4.8E-11	mg/kg/day	NA	mg/kg/day <sup>-1</sup>	---	3.3E-09	mg/kg/day	1.5E+02	mg/kg/day	2.2E-11	
				CHROMIUM VI	1.1E+01	mg/kg	6.8E-12	mg/kg/day	NA	mg/kg/day <sup>-1</sup>	---	4.8E-10	mg/kg/day	NA	mg/kg/day	NA	
				DIELDRIN	3.5E-02	mg/kg	2.2E-14	mg/kg/day	8.0E-01	mg/kg/day <sup>-1</sup>	1.7E-14	1.5E-12	mg/kg/day	1.0E-03	mg/kg/day	1.5E-09	
				IRON	2.3E+04	mg/kg	1.4E-08	mg/kg/day	NA	mg/kg/day <sup>-1</sup>	---	1.0E-06	mg/kg/day	3.0E+01	mg/kg/day	3.3E-08	
				LEAD	5.4E+01	mg/kg	3.3E-11	mg/kg/day	8.5E-05	mg/kg/day <sup>-1</sup>	2.8E-15	2.3E-09	mg/kg/day	NA	mg/kg/day	NA	
				METHYLENE CHLORIDE	2.1E+01	mg/kg	1.3E-11	mg/kg/day	1.4E-03	mg/kg/day <sup>-1</sup>	1.8E-14	9.2E-10	mg/kg/day	6.0E-01	mg/kg/day	1.5E-09	
				NAPHTHALENE	9.9E-01	mg/kg	6.1E-13	mg/kg/day	1.8E-02	mg/kg/day <sup>-1</sup>	1.1E-14	4.3E-11	mg/kg/day	1.3E-01	mg/kg/day	3.2E-10	
				PCB-1254 (AROCOR 1254)	8.1E-02	mg/kg	5.0E-14	mg/kg/day	7.5E-01	mg/kg/day <sup>-1</sup>	3.8E-14	3.5E-12	mg/kg/day	1.3E-04	mg/kg/day	2.6E-08	
				PHENANTHRENE	2.4E+00	mg/kg	1.5E-12	mg/kg/day	NA	mg/kg/day <sup>-1</sup>	---	1.0E-10	mg/kg/day	NA	mg/kg/day	NA	
				TETRACHLOROETHENE	3.2E+02	mg/kg	2.0E-10	mg/kg/day	5.4E-02	mg/kg/day <sup>-1</sup>	1.1E-11	1.4E-08	mg/kg/day	1.0E-01	mg/kg/day	1.4E-07	
				TOLUENE	1.3E+01	mg/kg	8.1E-12	mg/kg/day	NA	mg/kg/day <sup>-1</sup>	---	5.7E-10	mg/kg/day	8.0E-01	mg/kg/day	7.1E-10	
				TRICHLOROETHENE	3.0E+01	mg/kg	1.9E-11	mg/kg/day	1.3E-03	mg/kg/day <sup>-1</sup>	2.4E-14	1.3E-09	mg/kg/day	3.0E-03	mg/kg/day	4.3E-07	
				TRICHLOROFLUOROMETHANE (FREON 11)	4.7E+01	mg/kg	2.9E-11	mg/kg/day	NA	mg/kg/day <sup>-1</sup>	---	2.0E-09	mg/kg/day	3.0E+00	mg/kg/day	6.8E-10	
			Exp. Route Total								1.3E-11					6.5E-07	
			Exposure Point Total								1.3E-11					6.5E-07	
Soil Total											1.5E-06					9.5E-02	
											Total of Receptor Risks Across All Media	1.5E-06				Total of Receptor Hazards Across All Media	9.5E-02

ND: Not Detected.  
 NS: Not selected as an exposure pathway.  
 na: The chemical is listed, value is not available.  
 ne: The compound has not been evaluated by EPA for evidence of human carcinogenicity.

---: Risk was not calculated for chemical.  
 mg/kg: milligram per kilogram.  
 mg/kg/day: milligram per kilogram per day.  
 mg/kg/day<sup>-1</sup>: milligram per kilogram-day.  
 CTE: central tendency exposure

TABLE A3-7.4A - Parcel Site, RME  
 CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS  
 Reasonable Maximum Exposure  
 Omega Chemical Site - Whittier, California

Scenario Timeframe:	Current/Future
Receptor Population:	Construction Worker - RME
Receptor Age:	Adult

Cancer Intake		Noncancer Intake	
Surface Soil		Surface Soil	
Ingestion:	1.6E-08	Ingestion:	1.1E-06
Dermal:	4.1E-08	Dermal:	2.9E-06
Inhalation of fugitive dust:	1.2E-12	Inhalation of fugitive dust:	8.3E-11

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/ Exposure Concentration		CSF		Cancer Risk	Intake/ Exposure Concentration		RfD		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Soil	Surface and Subsurface Soil to 30' bgs	Surface and Subsurface Soil	Ingestion	1,1,1-TRICHLOROETHANE	2.6E+02	mg/kg	4.3E-06	mg/kg/day	NA	mg/kg/day <sup>-1</sup>	---	3.0E-04	mg/kg/day	2.8E-01	mg/kg/day	1.1E-03
				1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	1.3E+02	mg/kg	2.0E-06	mg/kg/day	NA	mg/kg/day <sup>-1</sup>	---	1.4E-04	mg/kg/day	3.0E-01	mg/kg/day	4.7E-04
				1,1-DICHLOROETHENE	1.3E+01	mg/kg	2.0E-07	mg/kg/day	NA	mg/kg/day <sup>-1</sup>	---	1.4E-05	mg/kg/day	5.0E-02	mg/kg/day	2.8E-04
				1,2-DICHLOROETHANE	1.6E+00	mg/kg	2.6E-08	mg/kg/day	9.1E-02	mg/kg/day <sup>-1</sup>	2.3E-09	1.8E-06	mg/kg/day	2.0E-02	mg/kg/day	9.0E-05
				1,4-DIOXANE	1.6E+01	mg/kg	2.6E-07	mg/kg/day	2.7E-02	mg/kg/day <sup>-1</sup>	6.9E-09	1.8E-05	mg/kg/day	NA	mg/kg/day	NA
				2-METHYLNAPHTHALENE	5.4E-01	mg/kg	8.7E-09	mg/kg/day	NA	mg/kg/day <sup>-1</sup>	---	6.1E-07	mg/kg/day	4.0E-03	mg/kg/day	1.5E-04
				BENZO(A)ANTHRACENE	2.1E+00	mg/kg	3.3E-08	mg/kg/day	1.2E+00	mg/kg/day <sup>-1</sup>	4.0E-08	2.3E-06	mg/kg/day	NA	mg/kg/day	NA
				BENZO(A)PYRENE	1.6E+00	mg/kg	2.6E-08	mg/kg/day	1.2E+01	mg/kg/day <sup>-1</sup>	3.1E-07	1.8E-06	mg/kg/day	NA	mg/kg/day	NA
				BENZO(B)FLUORANTHENE	9.1E-01	mg/kg	1.5E-08	mg/kg/day	1.2E+00	mg/kg/day <sup>-1</sup>	1.8E-08	1.0E-06	mg/kg/day	NA	mg/kg/day	NA
				BIS(2-ETHYLHEXYL)PHTHALATE	1.5E+01	mg/kg	2.5E-07	mg/kg/day	1.4E-02	mg/kg/day <sup>-1</sup>	3.5E-09	1.7E-05	mg/kg/day	2.0E-02	mg/kg/day	8.6E-04
				CHROMIUM	7.7E+01	mg/kg	1.2E-06	mg/kg/day	NA	mg/kg/day <sup>-1</sup>	---	8.7E-05	mg/kg/day	1.5E+00	mg/kg/day	5.8E-05
				CHROMIUM VI	1.1E+01	mg/kg	1.8E-07	mg/kg/day	NA	mg/kg/day <sup>-1</sup>	---	1.2E-05	mg/kg/day	3.0E-03	mg/kg/day	4.1E-03
				DIELDRIN	3.5E-02	mg/kg	5.6E-10	mg/kg/day	1.6E+01	mg/kg/day <sup>-1</sup>	9.0E-09	4.0E-08	mg/kg/day	5.0E-05	mg/kg/day	7.9E-04
				IRON	2.3E+04	mg/kg	3.7E-04	mg/kg/day	NA	mg/kg/day <sup>-1</sup>	---	2.6E-02	mg/kg/day	3.0E-01	mg/kg/day	8.7E-02
				LEAD	5.4E+01	mg/kg	8.6E-07	mg/kg/day	8.5E-03	mg/kg/day <sup>-1</sup>	7.3E-09	6.1E-05	mg/kg/day	NA	mg/kg/day	NA
				METHYLENE CHLORIDE	2.1E+01	mg/kg	3.4E-07	mg/kg/day	1.4E-02	mg/kg/day <sup>-1</sup>	4.8E-09	2.4E-05	mg/kg/day	6.0E-02	mg/kg/day	4.0E-04
				NAPHTHALENE	9.9E-01	mg/kg	1.6E-08	mg/kg/day	1.2E-01	mg/kg/day <sup>-1</sup>	1.9E-09	1.1E-06	mg/kg/day	2.0E-02	mg/kg/day	5.6E-05
				PCB-1254 (AROCOR 1254)	8.1E-02	mg/kg	1.3E-09	mg/kg/day	5.0E+00	mg/kg/day <sup>-1</sup>	6.6E-09	9.2E-08	mg/kg/day	2.0E-05	mg/kg/day	4.6E-03
				PHENANTHRENE	2.4E+00	mg/kg	3.8E-08	mg/kg/day	NA	mg/kg/day <sup>-1</sup>	---	2.7E-06	mg/kg/day	NA	mg/kg/day	NA
				TETRACHLOROETHENE	3.2E+02	mg/kg	5.1E-06	mg/kg/day	5.4E-01	mg/kg/day <sup>-1</sup>	2.8E-06	3.6E-04	mg/kg/day	1.0E-02	mg/kg/day	3.6E-02
TOLUENE	1.3E+01	mg/kg	2.1E-07	mg/kg/day	NA	mg/kg/day <sup>-1</sup>	---	1.5E-05	mg/kg/day	8.0E-02	mg/kg/day	1.8E-04				
TRICHLOROETHENE	3.0E+01	mg/kg	4.9E-07	mg/kg/day	1.3E-02	mg/kg/day <sup>-1</sup>	6.3E-09	3.4E-05	mg/kg/day	3.0E-04	mg/kg/day	1.1E-01				
TRICHLOROFLUOROMETHANE (FREON 11)	4.7E+01	mg/kg	7.6E-07	mg/kg/day	NA	mg/kg/day <sup>-1</sup>	---	5.3E-05	mg/kg/day	3.0E-01	mg/kg/day	1.8E-04				
Exp. Route Total										3.18E-06					2.5E-01	

TABLE A3-7.4A - Parcel Site, RME  
 CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS  
 Reasonable Maximum Exposure  
 Omega Chemical Site - Whittier, California

Scenario Timeframe:	Current/Future
Receptor Population:	Construction Worker - RME
Receptor Age:	Adult

Cancer Intake		Noncancer Intake	
Surface Soil		Surface Soil	
Ingestion:	1.6E-08	Ingestion:	1.1E-06
Dermal:	4.1E-08	Dermal:	2.9E-06
Inhalation of fugitive dust:	1.2E-12	Inhalation of fugitive dust:	8.3E-11

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/ Exposure Concentration		CSF		Cancer Risk	Intake/ Exposure Concentration		RfD		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
			Dermal	1,1,1-TRICHLOROETHANE	2.6E+02	mg/kg	1.1E-05	mg/kg/day	NA	mg/kg/day <sup>-1</sup>	---	7.6E-04	mg/kg/day	2.8E+00	mg/kg/day	2.7E-04
				1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	1.3E+02	mg/kg	5.1E-06	mg/kg/day	NA	mg/kg/day <sup>-1</sup>	---	3.6E-04	mg/kg/day	3.0E+00	mg/kg/day	1.2E-04
				1,1-DICHLOROETHENE	1.3E+01	mg/kg	5.2E-07	mg/kg/day	NA	mg/kg/day <sup>-1</sup>	---	3.6E-05	mg/kg/day	5.0E-01	mg/kg/day	7.2E-05
				1,2-DICHLOROETHANE	1.6E+00	mg/kg	6.6E-08	mg/kg/day	9.1E-03	mg/kg/day <sup>-1</sup>	6.0E-10	4.6E-06	mg/kg/day	2.0E-01	mg/kg/day	2.3E-05
				1,4-DIOXANE	1.6E+01	mg/kg	6.5E-07	mg/kg/day	8.1E-04	mg/kg/day <sup>-1</sup>	5.3E-10	4.6E-05	mg/kg/day	NA	mg/kg/day	NA
				2-METHYLNAPHTHALENE	5.4E-01	mg/kg	2.2E-08	mg/kg/day	NA	mg/kg/day <sup>-1</sup>	---	1.5E-06	mg/kg/day	4.0E-02	mg/kg/day	3.9E-05
				BENZO(A)ANTHRACENE	2.1E+00	mg/kg	8.5E-08	mg/kg/day	1.8E-01	mg/kg/day <sup>-1</sup>	1.5E-08	6.0E-06	mg/kg/day	NA	mg/kg/day	NA
				BENZO(A)PYRENE	1.6E+00	mg/kg	6.6E-08	mg/kg/day	1.8E+00	mg/kg/day <sup>-1</sup>	1.2E-07	4.6E-06	mg/kg/day	NA	mg/kg/day	NA
				BENZO(B)FLUORANTHENE	9.1E-01	mg/kg	3.7E-08	mg/kg/day	1.8E-01	mg/kg/day <sup>-1</sup>	6.7E-09	2.6E-06	mg/kg/day	NA	mg/kg/day	NA
				BIS(2-ETHYLHEXYL)PHTHALATE	1.5E+01	mg/kg	6.3E-07	mg/kg/day	1.4E-03	mg/kg/day <sup>-1</sup>	8.8E-10	4.4E-05	mg/kg/day	2.0E-01	mg/kg/day	2.2E-04
				CHROMIUM	7.7E+01	mg/kg	3.2E-06	mg/kg/day	NA	mg/kg/day <sup>-1</sup>	---	2.2E-04	mg/kg/day	1.5E+02	mg/kg/day	1.5E-06
				CHROMIUM VI	1.1E+01	mg/kg	4.5E-07	mg/kg/day	NA	mg/kg/day <sup>-1</sup>	---	3.2E-05	mg/kg/day	NA	mg/kg/day	NA
				DIELDRIN	3.5E-02	mg/kg	1.4E-09	mg/kg/day	8.0E-01	mg/kg/day <sup>-1</sup>	1.1E-09	1.0E-07	mg/kg/day	1.0E-03	mg/kg/day	1.0E-04
				IRON	2.3E+04	mg/kg	9.5E-04	mg/kg/day	NA	mg/kg/day <sup>-1</sup>	---	6.7E-02	mg/kg/day	3.0E+01	mg/kg/day	2.2E-03
				LEAD	5.4E+01	mg/kg	2.2E-06	mg/kg/day	8.5E-05	mg/kg/day <sup>-1</sup>	1.9E-10	1.5E-04	mg/kg/day	NA	mg/kg/day	NA
				METHYLENE CHLORIDE	2.1E+01	mg/kg	8.7E-07	mg/kg/day	1.4E-03	mg/kg/day <sup>-1</sup>	1.2E-09	6.1E-05	mg/kg/day	6.0E-01	mg/kg/day	1.0E-04
				NAPHTHALENE	9.9E-01	mg/kg	4.1E-08	mg/kg/day	1.8E-02	mg/kg/day <sup>-1</sup>	7.3E-10	2.8E-06	mg/kg/day	1.3E-01	mg/kg/day	2.1E-05
				PCB-1254 (AROCOR 1254)	8.1E-02	mg/kg	3.3E-09	mg/kg/day	7.5E-01	mg/kg/day <sup>-1</sup>	2.5E-09	2.3E-07	mg/kg/day	1.3E-04	mg/kg/day	1.8E-03
				PHENANTHRENE	2.4E+00	mg/kg	9.8E-08	mg/kg/day	NA	mg/kg/day <sup>-1</sup>	---	6.8E-06	mg/kg/day	NA	mg/kg/day	NA
				TETRACHLOROETHENE	3.2E+02	mg/kg	1.3E-05	mg/kg/day	5.4E-02	mg/kg/day <sup>-1</sup>	7.0E-07	9.1E-04	mg/kg/day	1.0E-01	mg/kg/day	9.1E-03
				TOLUENE	1.3E+01	mg/kg	5.4E-07	mg/kg/day	NA	mg/kg/day <sup>-1</sup>	---	3.8E-05	mg/kg/day	8.0E-01	mg/kg/day	4.7E-05
				TRICHLOROETHENE	3.0E+01	mg/kg	1.2E-06	mg/kg/day	1.3E-03	mg/kg/day <sup>-1</sup>	1.6E-09	8.7E-05	mg/kg/day	3.0E-03	mg/kg/day	2.9E-02
				TRICHLOROFLUOROMETHANE (FREON 11)	4.7E+01	mg/kg	1.9E-06	mg/kg/day	NA	mg/kg/day <sup>-1</sup>	---	1.4E-04	mg/kg/day	3.0E+00	mg/kg/day	4.5E-05
			Exp. Route Total								8.5E-07					4.3E-02
			Exposure Point Total								4.0E-06					2.9E-01

TABLE A3-7.4A - Parcel Site, RME  
 CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS  
 Reasonable Maximum Exposure  
 Omega Chemical Site - Whittier, California

Scenario Timeframe:	Current/Future
Receptor Population:	Construction Worker - RME
Receptor Age:	Adult

Cancer Intake		Noncancer Intake	
Surface Soil		Surface Soil	
Ingestion:	1.6E-08	Ingestion:	1.1E-06
Dermal:	4.1E-08	Dermal:	2.9E-06
Inhalation of fugitive dust:	1.2E-12	Inhalation of fugitive dust:	8.3E-11

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations					
					Value	Units	Intake/ Exposure Concentration		CSF		Cancer Risk	Intake/ Exposure Concentration		RfD		Hazard Quotient	
							Value	Units	Value	Units		Value	Units	Value	Units		
		Fugitive Dust	Inhalation	1,1,1-TRICHLOROETHANE	2.6E+02	mg/kg	3.1E-10	mg/kg/day	NA	mg/kg/day <sup>-1</sup>	---	2.2E-08	mg/kg/day	2.8E+00	mg/kg/day	7.8E-09	
				1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	1.3E+02	mg/kg	1.5E-10	mg/kg/day	NA	mg/kg/day <sup>-1</sup>	---	1.0E-08	mg/kg/day	3.0E+00	mg/kg/day	3.5E-09	
				1,1-DICHLOROETHENE	1.3E+01	mg/kg	1.5E-11	mg/kg/day	NA	mg/kg/day <sup>-1</sup>	---	1.0E-09	mg/kg/day	5.0E-01	mg/kg/day	2.1E-09	
				1,2-DICHLOROETHANE	1.6E+00	mg/kg	1.9E-12	mg/kg/day	9.1E-03	mg/kg/day <sup>-1</sup>	1.7E-14	1.3E-10	mg/kg/day	2.0E-01	mg/kg/day	6.6E-10	
				1,4-DIOXANE	1.6E+01	mg/kg	1.9E-11	mg/kg/day	8.1E-04	mg/kg/day <sup>-1</sup>	1.5E-14	1.3E-09	mg/kg/day	NA	mg/kg/day	NA	
				2-METHYLNAPHTHALENE	5.4E-01	mg/kg	6.4E-13	mg/kg/day	NA	mg/kg/day <sup>-1</sup>	---	4.5E-11	mg/kg/day	4.0E-02	mg/kg/day	1.1E-09	
				BENZO(A)ANTHRACENE	2.1E+00	mg/kg	2.5E-12	mg/kg/day	1.8E-01	mg/kg/day <sup>-1</sup>	4.4E-13	1.7E-10	mg/kg/day	NA	mg/kg/day	NA	
				BENZO(A)PYRENE	1.6E+00	mg/kg	1.9E-12	mg/kg/day	1.8E+00	mg/kg/day <sup>-1</sup>	3.4E-12	1.3E-10	mg/kg/day	NA	mg/kg/day	NA	
				BENZO(B)FLUORANTHENE	9.1E-01	mg/kg	1.1E-12	mg/kg/day	1.8E-01	mg/kg/day <sup>-1</sup>	1.9E-13	7.5E-11	mg/kg/day	NA	mg/kg/day	NA	
				BIS(2-ETHYLHEXYL)PHTHALATE	1.5E+01	mg/kg	1.8E-11	mg/kg/day	1.4E-03	mg/kg/day <sup>-1</sup>	2.5E-14	1.3E-09	mg/kg/day	2.0E-01	mg/kg/day	6.3E-09	
				CHROMIUM	7.7E+01	mg/kg	9.1E-11	mg/kg/day	NA	mg/kg/day <sup>-1</sup>	---	6.4E-09	mg/kg/day	1.5E+02	mg/kg/day	4.3E-11	
				CHROMIUM VI	1.1E+01	mg/kg	1.3E-11	mg/kg/day	NA	mg/kg/day <sup>-1</sup>	---	9.1E-10	mg/kg/day	NA	mg/kg/day	NA	
				DIELDRIN	3.5E-02	mg/kg	4.2E-14	mg/kg/day	8.0E-01	mg/kg/day <sup>-1</sup>	3.3E-14	2.9E-12	mg/kg/day	1.0E-03	mg/kg/day	2.9E-09	
				IRON	2.3E+04	mg/kg	2.7E-08	mg/kg/day	NA	mg/kg/day <sup>-1</sup>	---	1.9E-06	mg/kg/day	3.0E+01	mg/kg/day	6.4E-08	
				LEAD	5.4E+01	mg/kg	6.4E-11	mg/kg/day	8.5E-05	mg/kg/day <sup>-1</sup>	5.4E-15	4.4E-09	mg/kg/day	NA	mg/kg/day	NA	
				METHYLENE CHLORIDE	2.1E+01	mg/kg	2.5E-11	mg/kg/day	1.4E-03	mg/kg/day <sup>-1</sup>	3.5E-14	1.8E-09	mg/kg/day	6.0E-01	mg/kg/day	2.9E-09	
				NAPHTHALENE	9.9E-01	mg/kg	1.2E-12	mg/kg/day	1.8E-02	mg/kg/day <sup>-1</sup>	2.1E-14	8.2E-11	mg/kg/day	1.3E-01	mg/kg/day	6.2E-10	
				PCB-1254 (AROCOR 1254)	8.1E-02	mg/kg	9.6E-14	mg/kg/day	7.5E-01	mg/kg/day <sup>-1</sup>	7.2E-14	6.7E-12	mg/kg/day	1.3E-04	mg/kg/day	5.1E-08	
				PHENANTHRENE	2.4E+00	mg/kg	2.8E-12	mg/kg/day	NA	mg/kg/day <sup>-1</sup>	---	2.0E-10	mg/kg/day	NA	mg/kg/day	NA	
				TETRACHLOROETHENE	3.2E+02	mg/kg	3.8E-10	mg/kg/day	5.4E-02	mg/kg/day <sup>-1</sup>	2.0E-11	2.6E-08	mg/kg/day	1.0E-01	mg/kg/day	2.6E-07	
				TOLUENE	1.3E+01	mg/kg	1.6E-11	mg/kg/day	NA	mg/kg/day <sup>-1</sup>	---	1.1E-09	mg/kg/day	8.0E-01	mg/kg/day	1.4E-09	
				TRICHLOROETHENE	3.0E+01	mg/kg	3.6E-11	mg/kg/day	1.3E-03	mg/kg/day <sup>-1</sup>	4.6E-14	2.5E-09	mg/kg/day	3.0E-03	mg/kg/day	8.3E-07	
				TRICHLOROFLUOROMETHANE (FREON 11)	4.7E+01	mg/kg	5.6E-11	mg/kg/day	NA	mg/kg/day <sup>-1</sup>	---	3.9E-09	mg/kg/day	3.0E+00	mg/kg/day	1.3E-09	
			Exp. Route Total								2.5E-11					1.2E-06	
			Exposure Point Total								2.5E-11					1.2E-06	
			Soil Total								4.0E-06					2.9E-01	
											Total of Receptor Risks Across All Media	4.0E-06				Total of Receptor Hazards Across All Media	2.9E-01

ND: Not Detected.  
 NS: Not selected as an exposure pathway.  
 na: The chemical is listed, value is not available.  
 ne: The compound has not been evaluated by EPA for evidence of human carcinogenicity.

---: Risk was not calculated for chemical.  
 mg/kg: milligram per kilogram.  
 mg/kg/day: milligram per kilogram per day.  
 mg/kg/day<sup>-1</sup>: milligram per kilogram-day.  
 RME: reasonable maximum exposure

TABLE A3-9.1A - Parcel Site, CTE  
 SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs  
 Central Tendency Exposure  
 Omega Chemical Site - Whittier, California

Scenario Timeframe:	Current/Future
Receptor Population:	Industrial Worker
Receptor:	Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Dermal	Inhalation	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Dermal	Inhalation	Exposure Routes Total
Soil	Surface  Soil 0'-3'	Surface  Soil 0'-3'	2-METHYLNAPHTHALENE	---	---	NA	---	Pulmonary alveolar proteinosis	5.9E-05	7.7E-05	NA	1.4E-04
			BIS(2-ETHYLHEXYL)PHTHALATE	4.8E-08	6.3E-08	NA	1.1E-07	Inc. liver weight	4.8E-04	6.3E-04	NA	1.1E-03
			CHROMIUM	---	---	NA	---	None	3.2E-05	4.3E-06	NA	3.7E-05
			CHROMIUM VI	---	---	NA	---	None	2.7E-03	NA	NA	2.7E-03
			DIELDRIN	4.5E-08	3.0E-08	NA	7.4E-08	Liver	1.6E-04	1.0E-04	NA	2.6E-04
			IRON	---	---	NA	---		3.8E-02	5.0E-03	NA	4.3E-02
			LEAD	6.6E-08	8.7E-09	NA	7.5E-08		NA	NA	NA	---
			NAPHTHALENE	2.5E-08	5.0E-08	NA	7.5E-08	Dec. body weight in males	2.9E-05	5.8E-05	NA	8.7E-05
			PCB-1254 (AROCLOR 1254)	2.2E-07	4.4E-07	NA	6.6E-07	Ocular exudate	6.2E-03	1.2E-02	NA	1.8E-02
			PHENANTHRENE	---	---	NA	---		NA	NA	NA	---
			Chemical Total	4.0E-07	5.9E-07	NA	9.9E-07		4.7E-02	1.8E-02	NA	6.6E-02
			Exposure Point Total				9.9E-07					6.6E-02
			Exposure Medium Total				9.9E-07					6.6E-02
			Surface Soil Total				9.9E-07					6.6E-02
Indoor Air	Indoor Air	Indoor Air	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	NA	NA	---	---	CNS	NA	NA	NA	---
			1,1-DICHLOROETHENE	NA	NA	---	---	Liver toxicity	NA	NA	1.8E-02	1.8E-02
			ACETONE	NA	NA	---	---	Kidney	NA	NA	4.3E-01	4.3E-01
			BENZENE	NA	NA	2.3E-05	2.3E-05	Dec. lymphocyte count	NA	NA	7.4E-02	7.4E-02
			CARBON TETRACHLORIDE	NA	NA	2.4E-06	2.4E-06	Liver lesions	NA	NA	3.9E-03	3.9E-03
			CHLOROFORM	NA	NA	4.6E-07	4.6E-07	Liver	NA	NA	1.9E-04	1.9E-04
			DICHLORODIFLUOROMETHANE	NA	NA	---	---	Dec. body weight	NA	NA	3.5E-03	3.5E-03
			ETHYLBENZENE	NA	NA	---	---	Liver and kidney toxicity	NA	NA	5.8E-03	5.8E-03
			METHYLENE CHLORIDE	NA	NA	2.1E-05	2.1E-05		NA	NA	1.5E-01	1.5E-01
			TETRACHLOROETHENE	NA	NA	8.8E-06	8.8E-06	Liver toxicity in mice	NA	NA	1.2E-01	1.2E-01
			TOLUENE	NA	NA	---	---	Inc. kidney weight	NA	NA	1.5E+00	1.5E+00
			TRICHLOROETHENE	NA	NA	8.6E-07	8.6E-07		NA	NA	2.0E-03	2.0E-03
			TRICHLOROFLUOROMETHANE (FREON 11)	NA	NA	---	---	Survival and histopathology	NA	NA	2.9E-03	2.9E-03
			Chemical Total	NA	NA	5.6E-05	5.6E-05		NA	NA	2.3E+00	2.3E+00
Exposure Point Total				5.6E-05					2.3E+00			
Exposure Medium Total				5.6E-05					2.3E+00			
Indoor Air Total				5.6E-05					2.3E+00			
Receptor Total				5.7E-05					2.4E+00			

Total Risk Across All Media =

6E-05

Total Hazard Across All Media =

2.4E+00

NA: Not applicable.

---: Risk was not calculated for chemical.

HI: Hazard Index.

CNS: Central Nervous System.

Total Liver HI Across All Media =

1.5E-01

Total Blood HI Across All Media =

7.4E-02

Total Kidney HI Across All Media =

1.9E+00

Total Other HI Across All Media =

2.1E-01

TABLE A3-9.1B - Parcel North, CTE  
 SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs  
 Central Tendency Exposure  
 Omega Chemical Site - Whittier, California

Scenario Timeframe:	Current/Future
Receptor Population:	Industrial Worker
Receptor:	Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Dermal	Inhalation	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Dermal	Inhalation	Exposure Routes Total
Indoor Air	Indoor Air	Indoor Air	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	NA	NA	---	---	CNS	NA	NA	NA	---
			1,1-DICHLOROETHENE	NA	NA	---	---	Liver toxicity	NA	NA	9.9E-03	9.9E-03
			1,4-DICHLOROBENZENE	NA	NA	7.3E-07	7.3E-07		NA	NA	2.2E-04	2.2E-04
			ACETONE	NA	NA	---	---	Kidney	NA	NA	2.4E-01	2.4E-01
			BENZENE	NA	NA	2.4E-06	2.4E-06	Dec. lymphocyte count	NA	NA	8.0E-03	8.0E-03
			CARBON TETRACHLORIDE	NA	NA	2.8E-06	2.8E-06	Liver lesions	NA	NA	4.7E-03	4.7E-03
			CHLOROFORM	NA	NA	6.4E-07	6.4E-07	Liver	NA	NA	2.6E-04	2.6E-04
			DICHLORODIFLUOROMETHANE	NA	NA	---	---	Dec. body weight	NA	NA	3.4E-03	3.4E-03
			ETHYLBENZENE	NA	NA	---	---	Liver and kidney toxicity	NA	NA	1.9E-04	1.9E-04
			METHYLENE CHLORIDE	NA	NA	3.9E-07	3.9E-07		NA	NA	2.8E-03	2.8E-03
			TETRACHLOROETHENE	NA	NA	1.1E-05	1.1E-05	Liver toxicity in mice	NA	NA	1.5E-01	1.5E-01
			TRICHLOROETHENE	NA	NA	2.2E-06	2.2E-06		NA	NA	5.1E-03	5.1E-03
			TRICHLOROFLUOROMETHANE (FREON 11)	NA	NA	---	---	Survival and histopathology	NA	NA	3.7E-03	3.7E-03
			Chemical Total	NA	NA	2.0E-05	2.0E-05		NA	NA	4.2E-01	4.2E-01
			Exposure Point Total							2.0E-05		
Exposure Medium Total							2.0E-05				4.2E-01	
Indoor Air Total							2.0E-05				4.2E-01	
Receptor Total							2.0E-05				4.2E-01	

Total Risk Across All Media=

2E-05

Total Hazard Across All Media =

4.2E-01

NA: Not applicable.

---: Risk was not calculated for chemical.

HI: Hazard Index.

CNS: Central Nervous System.

Total Liver HI Across All Media =

1.6E-01

Total Blood HI Across All Media =

8.0E-03

Total Kidney HI Across All Media =

2.4E-01

Total Other HI Across All Media =

1.5E-02

TABLE A3-9.1C - Parcel West, CTE  
 SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs  
 Central Tendency Exposure  
 Omega Chemical Site - Whittier, California

Scenario Timeframe:	Current/Future
Receptor Population:	Industrial Worker
Receptor:	Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Dermal	Inhalation	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Dermal	Inhalation	Exposure Routes Total
Indoor Air	Indoor Air	Indoor Air	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	NA	NA	---	---	CNS	NA	NA	NA	---
			1,1-DICHLOROETHENE	NA	NA	---	---	Liver toxicity	NA	NA	2.6E-02	2.6E-02
			1,4-DICHLOROBENZENE	NA	NA	2.8E-07	2.8E-07		NA	NA	8.5E-05	8.5E-05
			ACETONE	NA	NA	---	---	Kidney	NA	NA	3.1E-03	3.1E-03
			BENZENE	NA	NA	3.3E-06	3.3E-06	Dec. lymphocyte count	NA	NA	1.1E-02	1.1E-02
			CARBON TETRACHLORIDE	NA	NA	2.4E-06	2.4E-06	Liver lesions	NA	NA	3.9E-03	3.9E-03
			CHLOROFORM	NA	NA	4.6E-07	4.6E-07	Liver	NA	NA	1.9E-04	1.9E-04
			DICHLORODIFLUOROMETHANE	NA	NA	---	---	Dec. body weight	NA	NA	3.3E-03	3.3E-03
			ETHYLBENZENE	NA	NA	---	---	Liver and kidney toxicity	NA	NA	3.5E-04	3.5E-04
			METHYLENE CHLORIDE	NA	NA	1.2E-07	1.2E-07		NA	NA	8.5E-04	8.5E-04
			TETRACHLOROETHENE	NA	NA	4.9E-05	4.9E-05	Liver toxicity in mice	NA	NA	6.6E-01	6.6E-01
			TRICHLOROETHENE	NA	NA	7.0E-07	7.0E-07		NA	NA	1.6E-03	1.6E-03
			TRICHLOROFLUOROMETHANE (FREON 11)	NA	NA	---	---	Survival and histopathology	NA	NA	2.2E-03	2.2E-03
			Chemical Total	NA	NA	5.6E-05	5.6E-05		NA	NA	7.1E-01	7.1E-01
			Exposure Point Total						5.6E-05			
Exposure Medium Total						5.6E-05				7.1E-01		
Indoor Air Total						5.6E-05				7.1E-01		
Receptor Total						5.6E-05				7.1E-01		

Total Risk Across All Media=

6E-05

Total Hazard Across All Media =

7.1E-01

NA: Not applicable.

---: Risk was not calculated for chemical.

HI: Hazard Index.

CNS: Central Nervous System.

Total Liver HI Across All Media =

6.7E-01

Total Blood HI Across All Media =

1.1E-02

Total Kidney HI Across All Media =

3.4E-03

Total Other HI Across All Media =

3.3E-02

TABLE A3-9.1D - Parcel South - Bishop, CTE  
 SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs  
 Central Tendency Exposure  
 Omega Chemical Site - Whittier, California

Scenario Timeframe:	Current/Future
Receptor Population:	Industrial Worker
Receptor:	Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Dermal	Inhalation	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Dermal	Inhalation	Exposure Routes Total
Indoor Air	Indoor Air	Indoor Air	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	NA	NA	---	---	CNS	NA	NA	NA	---
			1,1-DICHLOROETHENE	NA	NA	---	---	Liver toxicity	NA	NA	1.6E-02	1.6E-02
			1,4-DICHLOROBENZENE	NA	NA	3.0E-07	3.0E-07		NA	NA	9.1E-05	9.1E-05
			ACETONE	NA	NA	---	---	Kidney	NA	NA	3.0E-03	3.0E-03
			BENZENE	NA	NA	2.9E-06	2.9E-06	Dec. lymphocyte count	NA	NA	9.5E-03	9.5E-03
			CARBON TETRACHLORIDE	NA	NA	2.0E-06	2.0E-06	Liver lesions	NA	NA	3.3E-03	3.3E-03
			CHLOROFORM	NA	NA	3.3E-07	3.3E-07	Liver	NA	NA	1.3E-04	1.3E-04
			DICHLORODIFLUOROMETHANE	NA	NA	---	---	Dec. body weight	NA	NA	3.4E-03	3.4E-03
			ETHYLBENZENE	NA	NA	---	---	Liver and kidney toxicity	NA	NA	4.0E-04	4.0E-04
			METHYLENE CHLORIDE	NA	NA	1.4E-07	1.4E-07		NA	NA	9.7E-04	9.7E-04
			TETRACHLOROETHENE	NA	NA	1.4E-05	1.4E-05	Liver toxicity in mice	NA	NA	1.9E-01	1.9E-01
			TRICHLOROFLUOROMETHANE (FREON 11)	NA	NA	---	---	Survival and histopathology	NA	NA	1.2E-03	1.2E-03
			Chemical Total	NA	NA	2.0E-05	2.0E-05		NA	NA	2.3E-01	2.3E-01
			Exposure Point Total				2.0E-05					2.3E-01
Exposure Medium Total				2.0E-05					2.3E-01			
Indoor Air Total				2.0E-05					2.3E-01			
Receptor Total				2.0E-05					2.3E-01			

Total Risk Across All Media =

2E-05

Total Hazard Across All Media =

2.3E-01

NA: Not applicable.

---: Risk was not calculated for chemical.

HI: Hazard Index.

CNS: Central Nervous System.

Total Liver HI Across All Media =

2.1E-01

Total Blood HI Across All Media =

9.5E-03

Total Kidney HI Across All Media =

3.4E-03

Total Other HI Across All Media =

5.2E-03

TABLE A3-9.1E - Parcel South - LA Carts/Oncology Care, CTE  
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs  
Central Tendency Exposure  
Omega Chemical Site - Whittier, California

Scenario Timeframe:	Current/Future
Receptor Population:	Industrial Worker
Receptor:	Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Dermal	Inhalation	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Dermal	Inhalation	Exposure Routes Total
Indoor Air	Indoor Air	Indoor Air	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	NA	NA	---	---	CNS	NA	NA	NA	---
			1,1-DICHLOROETHENE	NA	NA	---	---	Liver toxicity	NA	NA	3.3E-03	3.3E-03
			1,2-DICHLOROETHANE	NA	NA	6.6E-07	6.6E-07		NA	NA	1.4E-02	1.4E-02
			1,4-DICHLOROBENZENE	NA	NA	3.6E-07	3.6E-07		NA	NA	1.1E-04	1.1E-04
			ACETONE	NA	NA	---	---	Kidney	NA	NA	8.4E-02	8.4E-02
			BENZENE	NA	NA	4.5E-06	4.5E-06	Dec. lymphocyte count	NA	NA	1.5E-02	1.5E-02
			CARBON TETRACHLORIDE	NA	NA	1.8E-06	1.8E-06	Liver lesions	NA	NA	2.9E-03	2.9E-03
			CHLOROFORM	NA	NA	1.2E-06	1.2E-06	Liver	NA	NA	4.8E-04	4.8E-04
			DICHLORODIFLUOROMETHANE	NA	NA	---	---	Dec. body weight	NA	NA	3.8E-03	3.8E-03
			ETHYLBENZENE	NA	NA	---	---	Liver and kidney toxicity	NA	NA	4.1E-04	4.1E-04
			METHYLENE CHLORIDE	NA	NA	4.4E-07	4.4E-07		NA	NA	3.1E-03	3.1E-03
			TETRACHLOROETHENE	NA	NA	7.8E-07	7.8E-07	Liver toxicity in mice	NA	NA	1.1E-02	1.1E-02
			TOLUENE	NA	NA	---	---	Inc. kidney weight	NA	NA	4.3E-01	4.3E-01
			TRICHLOROFLUOROMETHANE (FREON 11)	NA	NA	---	---	Survival and histopathology	NA	NA	9.7E-04	9.7E-04
			Chemical Total				NA	NA	9.7E-06	9.7E-06		NA
Exposure Point Total							9.7E-06					5.7E-01
Exposure Medium Total							9.7E-06					5.7E-01
Indoor Air Total							9.7E-06					5.7E-01
Receptor Total							9.7E-06					5.7E-01

Total Risk Across All Media =

1E-05

Total Hazard Across All Media =

5.7E-01

NA: Not applicable.

---: Risk was not calculated for chemical.

HI: Hazard Index.

CNS: Central Nervous System.

Total Liver HI Across All Media =

1.8E-02

Total Blood HI Across All Media =

1.5E-02

Total Kidney HI Across All Media =

5.1E-01

Total Other HI Across All Media =

2.2E-02

TABLE A3-9.1F - Parcel South, CTE  
 SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs  
 Central Tendency Exposure  
 Omega Chemical Site - Whittier, California

Scenario Timeframe:	Current/Future
Receptor Population:	Industrial Worker
Receptor:	Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Dermal	Inhalation	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Dermal	Inhalation	Exposure Routes Total
Soil Gas	Indoor Air	Indoor Air	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	NA	NA	---	---	CNS	NA	NA	NA	---
			1,1-DICHLOROETHENE	NA	NA	---	---	Liver toxicity	NA	NA	2.7E-01	2.7E-01
			1,2,4-TRIMETHYLBENZENE	NA	NA	---	---		NA	NA	1.2E-04	1.2E-04
			2,2,4-TRIMETHYLPENTANE	NA	NA	---	---		NA	NA	NA	---
			2-BUTANONE	NA	NA	---	---	Dec. offspring weight	NA	NA	9.5E-08	9.5E-08
			4-ETHYLTOLUENE	NA	NA	---	---		NA	NA	NA	---
			ACETONE	NA	NA	---	---	Kidney	NA	NA	4.9E-06	4.9E-06
			CARBON DISULFIDE	NA	NA	---	---	Fetal toxicity	NA	NA	1.2E-06	1.2E-06
			CHLOROFORM	NA	NA	7.2E-09	7.2E-09	Liver	NA	NA	2.9E-06	2.9E-06
			DICHLORODIFLUOROMETHANE	NA	NA	---	---	Dec. body weight	NA	NA	2.4E-03	2.4E-03
			HEXANE (N-HEXANE)	NA	NA	---	---		NA	NA	1.7E-06	1.7E-06
			TETRACHLOROETHENE	NA	NA	9.0E-06	9.0E-06	Liver toxicity in mice	NA	NA	1.2E-01	1.2E-01
			TRICHLOROETHENE	NA	NA	1.8E-06	1.8E-06		NA	NA	4.1E-03	4.1E-03
			TRICHLOROFLUOROMETHANE (FREON 11)	NA	NA	---	---	Survival and histopathology	NA	NA	4.8E-02	4.8E-02
			Chemical Total				NA	NA	1.1E-05	1.1E-05		NA
Exposure Point Total							1.1E-05					4.5E-01
Exposure Medium Total							1.1E-05					4.5E-01
Soil Gas Total							1.1E-05					4.5E-01
Receptor Total							1.1E-05					4.5E-01

Total Risk Across All Media =

1E-05

Total Hazard Across All Media =

4.5E-01

NA: Not applicable.

---: Risk was not calculated for chemical.

HI: Hazard Index.

CNS: Central Nervous System.

Total Liver HI Across All Media =

2.7E-01

Total Offspring HI Across All Media =

1.2E-06

Total Kidney HI Across All Media =

4.9E-06

Total Other HI Across All Media =

1.8E-01

TABLE A3-9.2A - Parcel Site, RME  
 SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs  
 Reasonable Maximum Exposure  
 Omega Chemical Site - Whittier, California

Scenario Timeframe:	Current/Future
Receptor Population:	Industrial Worker
Receptor:	Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient					
				Ingestion	Dermal	Inhalation	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Dermal	Inhalation	Exposure Routes Total	
Soil	Surface  Soil 0'-3'	Surface  Soil 0'-3'	2-METHYLNAPHTHALENE	---	---	NA	---	Pulmonary alveolar proteinosis	1.2E-04	7.7E-05	NA	1.9E-04	
			BIS(2-ETHYLHEXYL)PHTHALATE	9.5E-08	6.3E-08	NA	1.6E-07	Inc. liver weight	9.5E-04	6.3E-04	NA	1.6E-03	
			CHROMIUM	---	---	NA	---	None	6.5E-05	4.3E-06	NA	6.9E-05	
			CHROMIUM VI	---	---	NA	---	None	5.4E-03	NA	NA	5.4E-03	
			DIELDRIN	9.0E-08	3.0E-08	NA	1.2E-07	Liver	3.1E-04	1.0E-04	NA	4.2E-04	
			IRON	---	---	NA	---		7.6E-02	5.0E-03	NA	8.1E-02	
			LEAD	1.3E-07	8.7E-09	NA	1.4E-07		NA	NA	NA	---	
			NAPHTHALENE	5.0E-08	5.0E-08	NA	1.0E-07	Dec. body weight in males	5.9E-05	5.8E-05	NA	1.2E-04	
			PCB-1254 (AROCLOR 1254)	4.4E-07	4.4E-07	NA	8.8E-07	Ocular exudate	1.2E-02	1.2E-02	NA	2.5E-02	
			PHENANTHRENE	---	---	NA	---		NA	NA	NA	---	
			Chemical Total	8.1E-07	5.9E-07	NA	1.4E-06		9.5E-02	1.8E-02	NA	1.1E-01	
			Exposure Point Total				1.4E-06						1.1E-01
			Exposure Medium Total				1.4E-06						1.1E-01
			Surface Soil Total				1.4E-06						1.1E-01
Indoor Air	Indoor Air	Indoor Air	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	NA	NA	---	---	CNS	NA	NA	NA	---	
			1,1-DICHLOROETHENE	NA	NA	---	---	Liver toxicity	NA	NA	2.6E-02	2.6E-02	
			ACETONE	NA	NA	---	---	Kidney	NA	NA	6.2E-01	6.2E-01	
			BENZENE	NA	NA	3.3E-05	3.3E-05	Dec. lymphocyte count	NA	NA	1.1E-01	1.1E-01	
			CARBON TETRACHLORIDE	NA	NA	3.5E-06	3.5E-06	Liver lesions	NA	NA	5.7E-03	5.7E-03	
			CHLOROFORM	NA	NA	6.6E-07	6.6E-07	Liver	NA	NA	2.7E-04	2.7E-04	
			DICHLORODIFLUOROMETHANE	NA	NA	---	---	Dec. body weight	NA	NA	5.0E-03	5.0E-03	
			ETHYLBENZENE	NA	NA	---	---	Liver and kidney toxicity	NA	NA	8.4E-03	8.4E-03	
			METHYLENE CHLORIDE	NA	NA	3.0E-05	3.0E-05		NA	NA	2.1E-01	2.1E-01	
			TETRACHLOROETHENE	NA	NA	1.3E-05	1.3E-05	Liver toxicity in mice	NA	NA	1.7E-01	1.7E-01	
			TOLUENE	NA	NA	---	---	Inc. kidney weight	NA	NA	2.2E+00	2.2E+00	
			TRICHLOROETHENE	NA	NA	1.2E-06	1.2E-06		NA	NA	2.9E-03	2.9E-03	
			TRICHLOROFLUOROMETHANE (FREON 11)	NA	NA	---	---	Survival and histopathology	NA	NA	4.2E-03	4.2E-03	
			Chemical Total	NA	NA	8.1E-05	8.1E-05		NA	NA	3.3E+00	3.3E+00	
Exposure Point Total				8.1E-05						3.3E+00			
Exposure Medium Total				8.1E-05						3.3E+00			
Indoor Air Total				8.1E-05						3.3E+00			
Receptor Total				8.2E-05						3.4E+00			

Total Risk Across All Media=

8E-05

Total Hazard Across All Media =

3.4E+00

NA: Not applicable.  
 ---: Risk was not calculated for chemical.  
 HI: Hazard Index.  
 CNS: Central Nervous System.

Total Liver HI Across All Media =  
 Total Blood HI Across All Media =  
 Total Kidney HI Across All Media =  
 Total Other HI Across All Media =

2.1E-01  
 1.1E-01  
 2.8E+00  
 3.3E-01

TABLE A3-9.2B - Parcel North, RME  
 SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs  
 Reasonable Maximum Exposure  
 Omega Chemical Site - Whittier, California

Scenario Timeframe:	Current/Future
Receptor Population:	Industrial Worker
Receptor:	Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Dermal	Inhalation	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Dermal	Inhalation	Exposure Routes Total
Indoor Air	Indoor Air	Indoor Air	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	NA	NA	---	---	CNS	NA	NA	NA	---
			1,1-DICHLOROETHENE	NA	NA	---	---	Liver toxicity	NA	NA	1.4E-02	1.4E-02
			1,4-DICHLOROBENZENE	NA	NA	1.0E-06	1.0E-06		NA	NA	3.2E-04	3.2E-04
			ACETONE	NA	NA	---	---	Kidney	NA	NA	3.5E-01	3.5E-01
			BENZENE	NA	NA	3.5E-06	3.5E-06	Dec. lymphocyte count	NA	NA	1.2E-02	1.2E-02
			CARBON TETRACHLORIDE	NA	NA	4.1E-06	4.1E-06	Liver lesions	NA	NA	6.7E-03	6.7E-03
			CHLOROFORM	NA	NA	9.2E-07	9.2E-07	Liver	NA	NA	3.7E-04	3.7E-04
			DICHLORODIFLUOROMETHANE	NA	NA	---	---	Dec. body weight	NA	NA	5.0E-03	5.0E-03
			ETHYLBENZENE	NA	NA	---	---	Liver and kidney toxicity	NA	NA	2.7E-04	2.7E-04
			METHYLENE CHLORIDE	NA	NA	5.7E-07	5.7E-07		NA	NA	4.0E-03	4.0E-03
			TETRACHLOROETHENE	NA	NA	1.6E-05	1.6E-05	Liver toxicity in mice	NA	NA	2.1E-01	2.1E-01
			TRICHLOROETHENE	NA	NA	3.2E-06	3.2E-06		NA	NA	7.4E-03	7.4E-03
			TRICHLOROFLUOROMETHANE (FREON 11)	NA	NA	---	---	Survival and histopathology	NA	NA	5.3E-03	5.3E-03
			Chemical Total	NA	NA	2.9E-05	2.9E-05		NA	NA	6.1E-01	6.1E-01
Exposure Point Total						2.9E-05				6.1E-01		
Exposure Medium Total						2.9E-05				6.1E-01		
Indoor Air Total						2.9E-05				6.1E-01		
Receptor Total						2.9E-05				6.1E-01		

Total Risk Across All Media=

3E-05

Total Hazard Across All Media =

6.1E-01

NA: Not applicable.

---: Risk was not calculated for chemical.

HI: Hazard Index.

CNS: Central Nervous System.

Total Liver HI Across All Media =

2.3E-01

Total Blood HI Across All Media =

1.2E-02

Total Kidney HI Across All Media =

3.5E-01

Total Other HI Across All Media =

2.2E-02

TABLE A3-9.2C - Parcel West, RME  
 SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs  
 Reasonable Maximum Exposure  
 Omega Chemical Site - Whittier, California

Scenario Timeframe:	Current/Future
Receptor Population:	Industrial Worker
Receptor:	Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Dermal	Inhalation	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Dermal	Inhalation	Exposure Routes Total
Indoor Air	Indoor Air	Indoor Air	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	NA	NA	---	---	CNS	NA	NA	NA	---
			1,1-DICHLOROETHENE	NA	NA	---	---	Liver toxicity	NA	NA	3.7E-02	3.7E-02
			1,4-DICHLOROBENZENE	NA	NA	4.0E-07	4.0E-07		NA	NA	1.2E-04	1.2E-04
			ACETONE	NA	NA	---	---	Kidney	NA	NA	4.5E-03	4.5E-03
			BENZENE	NA	NA	4.8E-06	4.8E-06	Dec. lymphocyte count	NA	NA	1.6E-02	1.6E-02
			CARBON TETRACHLORIDE	NA	NA	3.5E-06	3.5E-06	Liver lesions	NA	NA	5.7E-03	5.7E-03
			CHLOROFORM	NA	NA	6.6E-07	6.6E-07	Liver	NA	NA	2.7E-04	2.7E-04
			DICHLORODIFLUOROMETHANE	NA	NA	---	---	Dec. body weight	NA	NA	4.7E-03	4.7E-03
			ETHYLBENZENE	NA	NA	---	---	Liver and kidney toxicity	NA	NA	5.1E-04	5.1E-04
			METHYLENE CHLORIDE	NA	NA	1.7E-07	1.7E-07		NA	NA	1.2E-03	1.2E-03
			TETRACHLOROETHENE	NA	NA	7.0E-05	7.0E-05	Liver toxicity in mice	NA	NA	9.6E-01	9.6E-01
			TRICHLOROETHENE	NA	NA	1.0E-06	1.0E-06		NA	NA	2.4E-03	2.4E-03
			TRICHLOROFLUOROMETHANE (FREON 11)	NA	NA	---	---	Survival and histopathology	NA	NA	3.2E-03	3.2E-03
			Chemical Total	NA	NA	8.1E-05	8.1E-05		NA	NA	1.0E+00	1.0E+00
			Exposure Point Total						8.1E-05			
Exposure Medium Total						8.1E-05				1.0E+00		
Indoor Air Total						8.1E-05				1.0E+00		
Receptor Total						8.1E-05				1.0E+00		

Total Risk Across All Media=

8E-05

Total Hazard Across All Media =

1.0E+00

NA: Not applicable.

---: Risk was not calculated for chemical.

HI: Hazard Index.

CNS: Central Nervous System.

Total Liver HI Across All Media =

9.6E-01

Total Blood HI Across All Media =

1.6E-02

Total Kidney HI Across All Media =

5.0E-03

Total Other HI Across All Media =

4.8E-02

TABLE A3-9.2D - Parcel South - Bishop, RME  
 SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs  
 Reasonable Maximum Exposure  
 Omega Chemical Site - Whittier, California

Scenario Timeframe:	Current/Future
Receptor Population:	Industrial Worker
Receptor:	Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Dermal	Inhalation	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Dermal	Inhalation	Exposure Routes Total
Indoor Air	Indoor Air	Indoor Air	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	NA	NA	---	---	CNS	NA	NA	NA	---
			1,1-DICHLOROETHENE	NA	NA	---	---	Liver toxicity	NA	NA	2.4E-02	2.4E-02
			1,4-DICHLOROBENZENE	NA	NA	4.3E-07	4.3E-07		NA	NA	1.3E-04	1.3E-04
			ACETONE	NA	NA	---	---	Kidney	NA	NA	4.3E-03	4.3E-03
			BENZENE	NA	NA	4.2E-06	4.2E-06	Dec. lymphocyte count	NA	NA	1.4E-02	1.4E-02
			CARBON TETRACHLORIDE	NA	NA	2.9E-06	2.9E-06	Liver lesions	NA	NA	4.7E-03	4.7E-03
			CHLOROFORM	NA	NA	4.7E-07	4.7E-07	Liver	NA	NA	1.9E-04	1.9E-04
			DICHLORODIFLUOROMETHANE	NA	NA	---	---	Dec. body weight	NA	NA	4.9E-03	4.9E-03
			ETHYLBENZENE	NA	NA	---	---	Liver and kidney toxicity	NA	NA	5.7E-04	5.7E-04
			METHYLENE CHLORIDE	NA	NA	2.0E-07	2.0E-07		NA	NA	1.4E-03	1.4E-03
			TETRACHLOROETHENE	NA	NA	2.0E-05	2.0E-05	Liver toxicity in mice	NA	NA	2.7E-01	2.7E-01
			TRICHLOROFLUOROMETHANE (FREON 11)	NA	NA	---	---	Survival and histopathology	NA	NA	1.7E-03	1.7E-03
			Chemical Total	NA	NA	2.8E-05	2.8E-05		NA	NA	3.3E-01	3.3E-01
			Exposure Point Total				2.8E-05					3.3E-01
Exposure Medium Total				2.8E-05					3.3E-01			
Indoor Air Total				2.8E-05					3.3E-01			
Receptor Total				2.8E-05					3.3E-01			

Total Risk Across All Media =

3E-05

Total Hazard Across All Media =

3.3E-01

NA: Not applicable.

---: Risk was not calculated for chemical.

HI: Hazard Index.

CNS: Central Nervous System.

Total Liver HI Across All Media =

3.0E-01

Total Blood HI Across All Media =

1.4E-02

Total Kidney HI Across All Media =

4.9E-03

Total Other HI Across All Media =

7.6E-03

TABLE A3-9.2E - Parcel South - LA Carts/Oncology Care, RME  
 SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs  
 Reasonable Maximum Exposure  
 Omega Chemical Site - Whittier, California

Scenario Timeframe:	Current/Future
Receptor Population:	Industrial Worker
Receptor:	Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Dermal	Inhalation	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Dermal	Inhalation	Exposure Routes Total
Indoor Air	Indoor Air	Indoor Air	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	NA	NA	---	---	CNS	NA	NA	NA	---
			1,1-DICHLOROETHENE	NA	NA	---	---	Liver toxicity	NA	NA	4.8E-03	4.8E-03
			1,2-DICHLOROETHANE	NA	NA	9.5E-07	9.5E-07		NA	NA	2.1E-02	2.1E-02
			1,4-DICHLOROBENZENE	NA	NA	5.2E-07	5.2E-07		NA	NA	1.6E-04	1.6E-04
			ACETONE	NA	NA	---	---	Kidney	NA	NA	1.2E-01	1.2E-01
			BENZENE	NA	NA	6.4E-06	6.4E-06	Dec. lymphocyte count	NA	NA	2.1E-02	2.1E-02
			CARBON TETRACHLORIDE	NA	NA	2.6E-06	2.6E-06	Liver lesions	NA	NA	4.3E-03	4.3E-03
			CHLOROFORM	NA	NA	1.7E-06	1.7E-06	Liver	NA	NA	7.0E-04	7.0E-04
			DICHLORODIFLUOROMETHANE	NA	NA	---	---	Dec. body weight	NA	NA	5.4E-03	5.4E-03
			ETHYLBENZENE	NA	NA	---	---	Liver and kidney toxicity	NA	NA	6.0E-04	6.0E-04
			METHYLENE CHLORIDE	NA	NA	6.3E-07	6.3E-07		NA	NA	4.4E-03	4.4E-03
			TETRACHLOROETHENE	NA	NA	1.1E-06	1.1E-06	Liver toxicity in mice	NA	NA	1.5E-02	1.5E-02
			TOLUENE	NA	NA	---	---	Inc. kidney weight	NA	NA	6.2E-01	6.2E-01
			TRICHLOROFLUOROMETHANE (FREON 11)	NA	NA	---	---	Survival and histopathology	NA	NA	1.4E-03	1.4E-03
			Chemical Total	NA	NA	1.4E-05	1.4E-05		NA	NA	8.2E-01	8.2E-01
					Exposure Point Total							
		Exposure Medium Total								8.2E-01		
Indoor Air Total										8.2E-01		
Receptor Total										8.2E-01		

Total Risk Across All Media =

1E-05

Total Hazard Across All Media =

8.2E-01

NA: Not applicable.

---: Risk was not calculated for chemical.

HI: Hazard Index.

CNS: Central Nervous System.

Total Liver HI Across All Media =

2.6E-02

Total Blood HI Across All Media =

2.1E-02

Total Kidney HI Across All Media =

7.4E-01

Total Other HI Across All Media =

3.2E-02

TABLE A3-9.2F - Parcel South, RME  
 SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs  
 Reasonable Maximum Exposure  
 Omega Chemical Site - Whittier, California

Scenario Timeframe:	Current/Future
Receptor Population:	Industrial Worker
Receptor:	Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Dermal	Inhalation	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Dermal	Inhalation	Exposure Routes Total
Soil Gas	Indoor Air	Indoor Air	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	NA	NA	---	---	CNS	NA	NA	NA	---
			1,1-DICHLOROETHENE	NA	NA	---	---	Liver toxicity	NA	NA	3.9E-01	3.9E-01
			1,2,4-TRIMETHYLBENZENE	NA	NA	---	---		NA	NA	1.7E-04	1.7E-04
			2,2,4-TRIMETHYLPENTANE	NA	NA	---	---		NA	NA	NA	---
			2-BUTANONE	NA	NA	---	---	Dec. offspring weight	NA	NA	1.4E-07	1.4E-07
			4-ETHYLTOLUENE	NA	NA	---	---		NA	NA	NA	---
			ACETONE	NA	NA	---	---	Kidney	NA	NA	7.1E-06	7.1E-06
			CARBON DISULFIDE	NA	NA	---	---	Fetal toxicity	NA	NA	1.7E-06	1.7E-06
			CHLOROFORM	NA	NA	1.0E-08	1.0E-08	Liver	NA	NA	4.2E-06	4.2E-06
			DICHLORODIFLUOROMETHANE	NA	NA	---	---	Dec. body weight	NA	NA	3.5E-03	3.5E-03
			HEXANE (N-HEXANE)	NA	NA	---	---		NA	NA	2.4E-06	2.4E-06
			TETRACHLOROETHENE	NA	NA	1.3E-05	1.3E-05	Liver toxicity in mice	NA	NA	1.8E-01	1.8E-01
			TRICHLOROETHENE	NA	NA	2.5E-06	2.5E-06		NA	NA	5.9E-03	5.9E-03
			TRICHLOROFLUOROMETHANE (FREON 11)	NA	NA	---	---	Survival and histopathology	NA	NA	6.9E-02	6.9E-02
			Chemical Total				NA	NA	1.6E-05	1.6E-05		NA
Exposure Point Total							1.6E-05					6.5E-01
Exposure Medium Total							1.6E-05					6.5E-01
Soil Gas Total							1.6E-05					6.5E-01
Receptor Total							1.6E-05					6.5E-01

Total Risk Across All Media =

2E-05

Total Hazard Across All Media =

6.5E-01

NA: Not applicable.

---: Risk was not calculated for chemical.

HI: Hazard Index.

CNS: Central Nervous System.

Total Liver HI Across All Media =

3.9E-01

Total Offspring HI Across All Media =

1.8E-06

Total Kidney HI Across All Media =

7.1E-06

Total Other HI Across All Media =

2.6E-01

TABLE A3-9.3A - Parcel Site, CTE  
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs  
Central Tendency Exposure  
Omega Chemical Site - Whittier, California

Scenario Timeframe:	Current/Future
Receptor Population:	Construction Worker - CTE
Receptor:	Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Dermal	Inhalation of Fugitive Dust	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Dermal	Inhalation of Fugitive Dust	Exposure Routes Total
Soil	Soil 0 to 30'	Soil 0 to 30'	1,1,1-TRICHLOROETHANE	---	---	---	---	CNS Liver toxicity Pulmonary alveolar proteinosis Inc. liver weight None None Liver Dec. body weight in males Ocular exudate Liver toxicity in mice Inc. kidney weight Survival and histopathology	2.2E-04	2.7E-04	4.1E-09	4.9E-04
			1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	---	---	---	---		9.8E-05	1.2E-04	1.8E-09	2.2E-04
			1,1-DICHLOROETHENE	---	---	---	---		5.9E-05	7.2E-05	1.1E-09	1.3E-04
			1,2-DICHLOROETHANE	4.9E-10	6.0E-10	9.0E-15	1.1E-09		1.9E-05	2.3E-05	3.5E-10	4.2E-05
			1,4-DIOXANE	1.4E-09	5.3E-10	8.0E-15	2.0E-09		NA	NA	NA	---
			2-METHYLNAPHTHALENE	---	---	---	---		3.2E-05	3.9E-05	5.8E-10	7.0E-05
			BENZO(A)ANTHRACENE	8.4E-09	1.5E-08	2.3E-13	2.4E-08		NA	NA	NA	---
			BENZO(A)PYRENE	6.4E-08	1.2E-07	1.8E-12	1.8E-07		NA	NA	NA	---
			BENZO(B)FLUORANTHENE	3.7E-09	6.7E-09	1.0E-13	1.0E-08		NA	NA	NA	---
			BIS(2-ETHYLHEXYL)PHTHALATE	7.2E-10	8.8E-10	1.3E-14	1.6E-09		1.8E-04	2.2E-04	3.3E-09	4.0E-04
			CHROMIUM	---	---	---	---		1.2E-05	1.5E-06	2.2E-11	1.4E-05
			CHROMIUM VI	---	---	---	---		8.6E-04	NA	NA	8.6E-04
			DIELDRIN	1.9E-09	1.1E-09	1.7E-14	3.0E-09		1.6E-04	1.0E-04	1.5E-09	2.7E-04
			IRON	---	---	---	---		1.8E-02	2.2E-03	3.3E-08	2.0E-02
			LEAD	1.5E-09	1.9E-10	2.8E-15	1.7E-09		NA	NA	NA	---
			METHYLENE CHLORIDE	1.0E-09	1.2E-09	1.8E-14	2.2E-09		8.3E-05	1.0E-04	1.5E-09	1.9E-04
			NAPHTHALENE	4.0E-10	7.3E-10	1.1E-14	1.1E-09		1.2E-05	2.1E-05	3.2E-10	3.3E-05
			PCB-1254 (AROCLOR 1254)	1.4E-09	2.5E-09	3.8E-14	3.9E-09		9.6E-04	1.8E-03	2.6E-08	2.7E-03
			PHENANTHRENE	---	---	---	---		NA	NA	NA	---
			TETRACHLOROETHENE	5.8E-07	7.0E-07	1.1E-11	1.3E-06		7.5E-03	9.1E-03	1.4E-07	1.7E-02
			TOLUENE	---	---	---	---		3.8E-05	4.7E-05	7.1E-10	8.5E-05
			TRICHLOROETHENE	1.3E-09	1.6E-09	2.4E-14	2.9E-09		2.4E-02	2.9E-02	4.3E-07	5.2E-02
			TRICHLOROFLUOROMETHANE (FREON 11)	---	---	---	---		3.7E-05	4.5E-05	6.8E-10	8.2E-05
Chemical Total				6.6E-07	8.5E-07	1.3E-11	1.5E-06	5.2E-02	4.3E-02	6.5E-07	9.5E-02	
Exposure Point Total							1.5E-06				9.5E-02	
Exposure Medium Total							1.5E-06				9.5E-02	
Surface Soil Total							1.5E-06				9.5E-02	
Receptor Total							1.5E-06				9.5E-02	

Total Risk Across All Media=

2E-06

Total Hazard Across All Media =

9.5E-02

NA: Not applicable.

---: Risk was not calculated for chemical.

HI: Hazard Index.

CNS: Central Nervous System.

CTE: central tendency exposure

Total Liver HI Across All Media =

1.7E-02

Total Kidney HI Across All Media =

8.5E-05

Total CNS HI Across All Media =

2.2E-04

Total Other HI Across All Media =

7.7E-02

TABLE A3-9.4A - Parcel Site, RME  
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs  
Reasonable Maximum Exposure  
Omega Chemical Site - Whittier, California

Scenario Timeframe:	Current/Future
Receptor Population:	Construction Worker - RME
Receptor:	Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Dermal	Inhalation of Fugitive Dust	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Dermal	Inhalation of Fugitive Dust	Exposure Routes Total
Soil	Soil 0 to 30'	Soil 0 to 30'	1,1,1-TRICHLOROETHANE	---	---	---	---	CNS Liver toxicity Pulmonary alveolar proteinosis Inc. liver weight None None Liver Dec. body weight in males Ocular exudate Liver toxicity in mice Inc. kidney weight Survival and histopathology	1.1E-03	2.7E-04	7.8E-09	1.3E-03
			1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	---	---	---	---		4.7E-04	1.2E-04	3.5E-09	5.9E-04
			1,1-DICHLOROETHENE	---	---	---	---		2.8E-04	7.2E-05	2.1E-09	3.6E-04
			1,2-DICHLOROETHANE	2.3E-09	6.0E-10	1.7E-14	2.9E-09		9.0E-05	2.3E-05	6.6E-10	1.1E-04
			1,4-DIOXANE	6.9E-09	5.3E-10	1.5E-14	7.5E-09		NA	NA	NA	---
			2-METHYLNAPHTHALENE	---	---	---	---		1.5E-04	3.9E-05	1.1E-09	1.9E-04
			BENZO(A)ANTHRACENE	4.0E-08	1.5E-08	4.4E-13	5.5E-08		NA	NA	NA	---
			BENZO(A)PYRENE	3.1E-07	1.2E-07	3.4E-12	4.3E-07		NA	NA	NA	---
			BENZO(B)FLUORANTHENE	1.8E-08	6.7E-09	1.9E-13	2.4E-08		NA	NA	NA	---
			BIS(2-ETHYLHEXYL)PHTHALATE	3.5E-09	8.8E-10	2.5E-14	4.3E-09		8.6E-04	2.2E-04	6.3E-09	1.1E-03
			CHROMIUM	---	---	---	---		5.8E-05	1.5E-06	4.3E-11	6.0E-05
			CHROMIUM VI	---	---	---	---		4.1E-03	NA	NA	4.1E-03
			DIELDRIN	9.0E-09	1.1E-09	3.3E-14	1.0E-08		7.9E-04	1.0E-04	2.9E-09	8.9E-04
			IRON	---	---	---	---		8.7E-02	2.2E-03	6.4E-08	8.9E-02
			LEAD	7.3E-09	1.9E-10	5.4E-15	7.5E-09		NA	NA	NA	---
			METHYLENE CHLORIDE	4.8E-09	1.2E-09	3.5E-14	6.0E-09		4.0E-04	1.0E-04	2.9E-09	5.0E-04
			NAPHTHALENE	1.9E-09	7.3E-10	2.1E-14	2.6E-09		5.6E-05	2.1E-05	6.2E-10	7.7E-05
			PCB-1254 (AROCLOR 1254)	6.6E-09	2.5E-09	7.2E-14	9.1E-09		4.6E-03	1.8E-03	5.1E-08	6.3E-03
			PHENANTHRENE	---	---	---	---		NA	NA	NA	---
			TETRACHLOROETHENE	2.8E-06	7.0E-07	2.0E-11	3.5E-06		3.6E-02	9.1E-03	2.6E-07	4.5E-02
			TOLUENE	---	---	---	---		1.8E-04	4.7E-05	1.4E-09	2.3E-04
			TRICHLOROETHENE	6.3E-09	1.6E-09	4.6E-14	7.9E-09		1.1E-01	2.9E-02	8.3E-07	1.4E-01
			TRICHLOROFLUOROMETHANE (FREON 11)	---	---	---	---		1.8E-04	4.5E-05	1.3E-09	2.2E-04
Chemical Total				3.2E-06	8.5E-07	2.5E-11	4.0E-06	2.5E-01	4.3E-02	1.2E-06	2.9E-01	
Exposure Point Total							4.0E-06				2.9E-01	
Exposure Medium Total							4.0E-06				2.9E-01	
Surface Soil Total							4.0E-06				2.9E-01	
Receptor Total							4.0E-06				2.9E-01	

Total Risk Across All Media=

4E-06

Total Hazard Across All Media =

2.9E-01

NA: Not applicable.

---: Risk was not calculated for chemical.

HI: Hazard Index.

CNS: Central Nervous System.

RME: reasonable maximum exposure

Total Liver HI Across All Media =

4.7E-02

Total Kidney HI Across All Media =

2.3E-04

Total CNS HI Across All Media =

5.9E-04

Total Other HI Across All Media =

2.4E-01

**Appendix A-4**  
**Johnson and Ettinger Model Calculations**

**Appendix A4-1  
Summary of Johnson and Ettinger Model Results for  
Soil Gas to Indoor Air - South Parcel - Skateland**

CAS #	Chemical	Soil Gas Concentration		Cbuilding ug/m3	Unit risk factor, URF ( $\mu\text{g}/\text{m}^3$ ) <sup>-1</sup>	CSF ( $\text{mg}/\text{kg}/\text{day}$ ) <sup>-1</sup>	Reference conc., RfC ( $\text{mg}/\text{m}^3$ )	RfD ( $\text{mg}/\text{kg}/\text{day}$ )
		ppbv	ppmv					
76131	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	330000	330.0000	6.45E+02	0.00E+00	0.00E+00	3.01E+01	8.60E+00
75354	1,1-DICHLOROETHENE	210000	210.0000	2.37E+02	0.00E+00	0.00E+00	7.00E-02	2.00E-02
95636	1,2,4-TRIMETHYLBENZENE	3	0.0030	3.08E-03	0.00E+00	0.00E+00	5.95E-03	1.70E-03
	2,2,4-TRIMETHYLPENTANE	12	0.0120					
78933	2-BUTANONE	2.6	0.0026	2.08E-03	0.00E+00	0.00E+00	5.00E+00	1.43E+00
	4-ETHYLTOLUENE	2.4	0.0024					
67641	ACETONE	78	0.0780	6.84E-02	0.00E+00	0.00E+00	3.50E-01	1.00E-01
75150	CARBON DISULFIDE	3.6	0.0036	3.54E-03	0.00E+00	0.00E+00	7.00E-01	2.00E-01
67663	CHLOROFORM	2.5	0.0025	3.86E-03	5.30E-06	1.86E-02	3.00E-01	8.57E-02
75718	DICHLORODIFLUOROMETHANE	1900	1.9000	2.11E+00	0.00E+00	0.00E+00	2.00E-01	5.71E-02
110543	HEXANE (N-HEXANE)	3	0.0030	5.10E-03	0.00E+00	0.00E+00	2.00E-01	5.71E-02
127184	TETRACHLOROETHENE	11592	11.5923	1.88E+01	5.90E-06	2.07E-02	3.50E-02	1.00E-02
79016	TRICHLOROETHENE	7800	7.8000	1.08E+01	2.00E-06	7.00E-03	6.00E-01	1.71E-01
75694	TRICHLOROFLUOROMETHANE (FREON 11)	94000	94.0000	1.46E+02	0.00E+00	0.00E+00	7.00E-01	2.00E-01

- (1) Assumed an average soil temperature of 18oC per Figure A-1 in DTSC Indoor Air Guidance (Feb. 2005)
- (2) Assumed the soil was clay
- (3) Adjusted exposure frequency and duration to 250 days per year and 25 years typical for a commercial worker. Also added exposure time of 8 hrs/day.
- (4) Default building size of 10 meters length, 10 meters width, and 9-foot (274.32 cm) ceiling height was used
- (5) Building air exchange adjusted to 1 per hour for commercial building.

DATA ENTRY SHEET

SG-ADV  
Version 3.1; 02/04

Reset to  
Defaults

Soil Gas Concentration Data

ENTER Chemical CAS No. (numbers only, no dashes)	ENTER Soil gas conc., $C_g$ ( $\mu\text{g}/\text{m}^3$ )	OR	ENTER Soil gas conc., $C_g$ (ppmv)	Chemical
127184			1.16E+01	Tetrachloroethylene

MORE  
↓

ENTER Depth below grade to bottom of enclosed space floor, $L_F$ (cm)	ENTER Soil gas sampling depth below grade, $L_S$ (cm)	ENTER Average soil temperature, $T_S$ ( $^{\circ}\text{C}$ )	ENTER Totals must add up to value of $L_S$ (cell F24)			ENTER Soil stratum A SCS soil type (used to estimate soil vapor permeability)	OR	ENTER User-defined stratum A soil vapor permeability, $k_v$ ( $\text{cm}^2$ )
Thickness of soil stratum A, $h_A$ (cm)	Thickness of soil stratum B, (Enter value or 0) $h_B$ (cm)	Thickness of soil stratum C, (Enter value or 0) $h_C$ (cm)						
15	152.4	18	152.4			C		

MORE  
↓

ENTER Stratum A SCS soil type  Lookup Soil Parameters	ENTER Stratum A soil dry bulk density, $\rho_b^A$ ( $\text{g}/\text{cm}^3$ )	ENTER Stratum A soil total porosity, $n^A$ (unitless)	ENTER Stratum A soil water-filled porosity, $\theta_w^A$ ( $\text{cm}^3/\text{cm}^3$ )	ENTER Stratum B SCS soil type  Lookup Soil Parameters	ENTER Stratum B soil total bulk density, $\rho_b^B$ ( $\text{g}/\text{cm}^3$ )	ENTER Stratum B soil total porosity, $n^B$ (unitless)	ENTER Stratum B soil water-filled porosity, $\theta_w^B$ ( $\text{cm}^3/\text{cm}^3$ )	ENTER Stratum C SCS soil type  Lookup Soil Parameters	ENTER Stratum C soil dry bulk density, $\rho_b^C$ ( $\text{g}/\text{cm}^3$ )	ENTER Stratum C soil total porosity, $n^C$ (unitless)	ENTER Stratum C soil water-filled porosity, $\theta_w^C$ ( $\text{cm}^3/\text{cm}^3$ )
C	1.43	0.459	0.215	C	1.43	0.459	0.215	C	1.43	0.459	0.215

MORE  
↓

ENTER Enclosed space floor thickness, $L_{\text{crack}}$ (cm)	ENTER Soil-bldg. pressure differential, $\Delta P$ ( $\text{g}/\text{cm}\cdot\text{s}^2$ )	ENTER Enclosed space floor length, $L_B$ (cm)	ENTER Enclosed space floor width, $W_B$ (cm)	ENTER Enclosed space height, $H_B$ (cm)	ENTER Floor-wall seam crack width, $w$ (cm)	ENTER Indoor air exchange rate, $ER$ (1/h)	ENTER Average vapor flow rate into bldg. OR Leave blank to calculate $Q_{\text{soil}}$ (L/m)
15	40	1000	1000	274.32	0.1	1	5

ENTER Averaging time for carcinogens, $AT_C$ (yrs)	ENTER Averaging time for noncarcinogens, $AT_{NC}$ (yrs)	ENTER Exposure duration, $ED$ (yrs)	ENTER Exposure frequency, $EF$ (days/yr)	ENTER Exposure time $ET$ (hrs/day)
70	25	25	250	8

END

CHEMICAL PROPERTIES SHEET

Diffusivity in air, $D_a$ ( $\text{cm}^2/\text{s}$ )	Diffusivity in water, $D_w$ ( $\text{cm}^2/\text{s}$ )	Henry's law constant at reference temperature, H ( $\text{atm}\cdot\text{m}^3/\text{mol}$ )	Henry's law constant reference temperature, $T_R$ ( $^\circ\text{C}$ )	Enthalpy of vaporization at the normal boiling point, $\Delta H_{v,b}$ ( $\text{cal}/\text{mol}$ )	Normal boiling point, $T_B$ ( $^\circ\text{K}$ )	Critical temperature, $T_C$ ( $^\circ\text{K}$ )	Molecular weight, MW ( $\text{g}/\text{mol}$ )	Unit risk factor, URF ( $\mu\text{g}/\text{m}^3$ ) <sup>-1</sup>	Reference conc., RfC ( $\text{mg}/\text{m}^3$ )
7.20E-02	8.20E-06	1.84E-02	25	8,288	394.40	620.20	165.83	5.9E-06	3.5E-02

INTERMEDIATE CALCULATIONS SHEET

Exposure duration, $\tau$ (sec)	Source-building separation, $L_T$ (cm)	Stratum A soil air-filled porosity, $\theta_a^A$ (cm <sup>3</sup> /cm <sup>3</sup> )	Stratum B soil air-filled porosity, $\theta_a^B$ (cm <sup>3</sup> /cm <sup>3</sup> )	Stratum C soil air-filled porosity, $\theta_a^C$ (cm <sup>3</sup> /cm <sup>3</sup> )	Stratum A effective total fluid saturation, $S_{fe}$ (cm <sup>3</sup> /cm <sup>3</sup> )	Stratum A soil intrinsic permeability, $k_i$ (cm <sup>2</sup> )	Stratum A soil relative air permeability, $k_{rg}$ (cm <sup>2</sup> )	Stratum A soil effective vapor permeability, $k_v$ (cm <sup>2</sup> )	Floor-wall seam perimeter, $X_{crack}$ (cm)	Soil gas conc. ( $\mu\text{g}/\text{m}^3$ )	Bldg. ventilation rate, $Q_{building}$ (cm <sup>3</sup> /s)
7.88E+08	137.4	0.244	0.244	0.244	0.324	2.29E-09	0.821	1.88E-09	4,000	8.05E+04	7.62E+04

Area of enclosed space below grade, $A_B$ (cm <sup>2</sup> )	Crack-to-total area ratio, $\eta$ (unitless)	Crack depth below grade, $Z_{crack}$ (cm)	Enthalpy of vaporization at ave. soil temperature, $\Delta H_{v,TS}$ (cal/mol)	Henry's law constant at ave. soil temperature, $H_{TS}$ (atm·m <sup>3</sup> /mol)	Henry's law constant at ave. soil temperature, $H'_{TS}$ (unitless)	Vapor viscosity at ave. soil temperature, $\mu_{TS}$ (g/cm-s)	Stratum A effective diffusion coefficient, $D_A^{eff}$ (cm <sup>2</sup> /s)	Stratum B effective diffusion coefficient, $D_B^{eff}$ (cm <sup>2</sup> /s)	Stratum C effective diffusion coefficient, $D_C^{eff}$ (cm <sup>2</sup> /s)	Total overall effective diffusion coefficient, $D_T^{eff}$ (cm <sup>2</sup> /s)	Diffusion path length, $L_d$ (cm)
1.00E+06	4.00E-04	15	9,472	1.25E-02	5.23E-01	1.78E-04	3.12E-03	0.00E+00	0.00E+00	3.12E-03	137.4

Convection path length, $L_p$ (cm)	Source vapor conc., $C_{source}$ ( $\mu\text{g}/\text{m}^3$ )	Crack radius, $r_{crack}$ (cm)	Average vapor flow rate into bldg., $Q_{soil}$ (cm <sup>3</sup> /s)	Crack effective diffusion coefficient, $D_{crack}$ (cm <sup>2</sup> /s)	Area of crack, $A_{crack}$ (cm <sup>2</sup> )	Exponent of equivalent foundation Peclet number, $\exp(Pe^f)$ (unitless)	Infinite source indoor attenuation coefficient, $\alpha$ (unitless)	Infinite source bldg. conc., $C_{building}$ ( $\mu\text{g}/\text{m}^3$ )	Unit risk factor, URF ( $\mu\text{g}/\text{m}^3$ ) <sup>-1</sup>	Reference conc., RfC (mg/m <sup>3</sup> )
15	8.05E+04	0.10	8.33E+01	3.12E-03	4.00E+02	#NUM!	2.34E-04	1.88E+01	5.9E-06	3.5E-02

END

RESULTS SHEET

INCREMENTAL RISK CALCULATIONS:

Incremental risk from vapor intrusion to indoor air, carcinogen (unitless)	Hazard quotient from vapor intrusion to indoor air, noncarcinogen (unitless)
9.1E-06	1.2E-01

MESSAGE AND ERROR SUMMARY BELOW: (DO NOT USE RESULTS IF ERRORS ARE PRESENT)

Formulas were altered to incorporate exposure time

**SCROLL  
DOWN  
TO "END"**

**END**

VLOOKUP TABLES

SCS Soil Type	Soil Properties Lookup Table							Bulk Density		
	K <sub>s</sub> (cm/h)	α <sub>1</sub> (1/cm)	N (unitless)	M (unitless)	n (cm <sup>3</sup> /cm <sup>3</sup> )	θ <sub>r</sub> (cm <sup>3</sup> /cm <sup>3</sup> )	Mean Grain Diameter (cm)	(g/cm <sup>3</sup> )	θ <sub>w</sub> (cm <sup>3</sup> /cm <sup>3</sup> )	SCS Soil Name
C	0.61	0.01496	1.253	0.2019	0.459	0.098	0.0092	1.43	0.215	Clay
CL	0.34	0.01581	1.416	0.2938	0.442	0.079	0.016	1.48	0.168	Clay Loam
L	0.50	0.01112	1.472	0.3207	0.399	0.061	0.020	1.59	0.148	Loam
LS	4.38	0.03475	1.746	0.4273	0.390	0.049	0.040	1.62	0.076	Loamy Sand
S	26.78	0.03524	3.177	0.6852	0.375	0.053	0.044	1.66	0.054	Sand
SC	0.47	0.03342	1.208	0.1722	0.385	0.117	0.025	1.63	0.197	Sandy Clay
SCL	0.55	0.02109	1.330	0.2481	0.384	0.063	0.029	1.63	0.146	Sandy Clay Loam
SI	1.82	0.00658	1.679	0.4044	0.489	0.050	0.0046	1.35	0.167	Silt
SIC	0.40	0.01622	1.321	0.2430	0.481	0.111	0.0039	1.38	0.216	Silty Clay
SICL	0.46	0.00839	1.521	0.3425	0.482	0.090	0.0056	1.37	0.198	Silty Clay Loam
SIL	0.76	0.00506	1.663	0.3987	0.439	0.065	0.011	1.49	0.180	Silt Loam
SL	1.60	0.02667	1.449	0.3099	0.387	0.039	0.030	1.62	0.103	Sandy Loam

CAS No.	Chemical	Chemical Properties Lookup Table											URF extrapolated (X)	RfC extrapolated (X)		
		Organic carbon partition coefficient, K <sub>oc</sub> (cm <sup>3</sup> /g)	Diffusivity in air, D <sub>a</sub> (cm <sup>2</sup> /s)	Diffusivity in water, D <sub>w</sub> (cm <sup>2</sup> /s)	Pure component water solubility, S (mg/L)	Henry's law constant, H' (unitless)	Henry's law constant at reference temperature, H (atm·m <sup>3</sup> /mol)	Henry's law constant reference temperature, T <sub>R</sub> (°C)	Normal boiling point, T <sub>B</sub> (°K)	Critical temperature, T <sub>C</sub> (°K)	Enthalpy of vaporization at the normal boiling point, ΔH <sub>v,b</sub> (cal/mol)	Unit risk factor, URF (μg/m <sup>3</sup> ) <sup>-1</sup>			Reference conc., RfC (mg/m <sup>3</sup> )	Molecular weight, MW (g/mol)
56235	Carbon tetrachloride	1.74E+02	7.80E-02	8.80E-06	7.93E+02	1.24E+00	3.03E-02	25	349.90	556.60	7,127	4.2E-05	4.0E-02	1.54E+02		
57749	Chlordane	1.20E+05	1.18E-02	4.37E-06	5.60E-02	1.99E-03	4.85E-05	25	624.24	885.73	14,000	3.4E-04	7.0E-04	4.10E+02		
58899	gamma-HCH (Lindane)	1.07E+03	1.42E-02	7.34E-06	7.30E+00	5.73E-04	1.40E-05	25	596.55	839.36	15,000	3.1E-04	1.1E-03	2.91E+02	?	X
60297	Ethyl ether	5.73E+00	7.82E-02	8.61E-06	5.68E+04	1.35E+00	3.29E-02	25	307.50	466.74	6,338	0.0E+00	7.0E-01	7.41E+01		X
60571	Dieldrin	2.14E+04	1.25E-02	4.74E-06	1.95E-01	6.18E-04	1.51E-05	25	613.32	842.25	17,000	4.6E-03	1.8E-04	3.81E+02		X
67641	Acetone	5.75E-01	1.24E-01	1.14E-05	1.00E+06	1.59E-03	3.87E-05	25	329.20	508.10	6,955	0.0E+00	3.5E-01	5.81E+01		X
67663	Chloroform	3.98E+01	1.04E-01	1.00E-05	7.92E+03	1.50E-01	3.66E-03	25	334.32	536.40	6,988	5.3E-06	3.0E-01	1.19E+02		
67721	Hexachloroethane	1.78E+03	2.50E-03	6.80E-06	5.00E+01	1.59E-01	3.88E-03	25	458.00	695.00	9,510	1.1E-05	3.5E-03	2.37E+02		X
71432	Benzene	5.89E+01	8.80E-02	9.80E-06	1.79E+03	2.27E-01	5.54E-03	25	353.24	562.16	7,342	2.9E-05	3.0E-02	7.81E+01		
71556	1,1,1-Trichloroethane	1.10E+02	7.80E-02	8.80E-06	1.33E+03	7.03E-01	1.72E-02	25	347.24	545.00	7,136	0.0E+00	1.0E+00	1.33E+02		
72435	Methoxychlor	9.77E+04	1.56E-02	4.46E-06	1.00E-01	6.46E-04	1.58E-05	25	651.02	848.49	16,000	0.0E+00	1.8E-02	3.46E+02		X
72559	DDE	4.47E+06	1.44E-02	5.87E-06	1.20E-01	8.59E-04	2.09E-05	25	636.44	860.38	15,000	9.7E-05	0.0E+00	3.18E+02	?	
74839	Methyl bromide	1.05E+01	7.28E-02	1.21E-05	1.52E+04	2.55E-01	6.22E-03	25	276.71	467.00	5,714	0.0E+00	5.0E-03	9.49E+01		
74873	Methyl chloride (chloromethane)	2.12E+00	1.26E-01	6.50E-06	5.33E+03	3.61E-01	8.80E-03	25	249.00	416.25	5,115	1.0E-06	9.0E-02	5.05E+01		
74908	Hydrogen cyanide	3.80E+00	1.93E-01	2.10E-05	1.00E+06	5.44E-03	1.33E-04	25	299.00	456.70	6,676	0.0E+00	3.0E-03	2.70E+01		
74953	Methylene bromide	1.26E+01	4.30E-02	8.44E-06	1.19E+04	3.52E-02	8.59E-04	25	370.00	583.00	7,868	0.0E+00	3.5E-02	1.74E+02		X
75003	Chloroethane (ethyl chloride)	4.40E+00	2.71E-01	1.15E-05	5.68E+03	3.61E-01	8.80E-03	25	285.30	460.40	5,879	8.3E-07	1.0E+01	6.45E+01	X	
75014	Vinyl chloride (chloroethene)	1.86E+01	1.06E-01	1.23E-05	8.80E+03	1.10E+00	2.69E-02	25	259.25	432.00	5,250	7.8E-05	1.0E-01	6.25E+01		
75058	Acetonitrile	4.20E+00	1.28E-01	1.66E-05	1.00E+06	1.42E-03	3.45E-05	25	354.60	545.50	7,110	0.0E+00	6.0E-02	4.11E+01		
75070	Acetaldehyde	1.06E+00	1.24E-01	1.41E-05	1.00E+06	3.23E-03	7.87E-05	25	293.10	466.00	6,157	2.7E-06	9.0E-03	4.41E+01		
75092	Methylene chloride	1.17E+01	1.01E-01	1.17E-05	1.30E+04	8.96E-02	2.18E-03	25	313.00	510.00	6,706	1.0E-06	4.0E-01	8.49E+01		
75150	Carbon disulfide	4.57E+01	1.04E-01	1.00E-05	1.19E+03	1.24E+00	3.02E-02	25	319.00	552.00	6,391	0.0E+00	7.0E-01	7.61E+01		
75218	Ethylene oxide	1.33E+00	1.04E-01	1.45E-05	3.04E+05	2.27E-02	5.54E-04	25	283.60	469.00	6,104	8.8E-05	3.0E-02	4.41E+01		
75252	Bromoform	8.71E+01	1.49E-02	1.03E-05	3.10E+03	2.41E-02	5.88E-04	25	422.35	696.00	9,479	1.1E-06	7.0E-02	2.53E+02		X
75274	Bromodichloromethane	5.50E+01	2.98E-02	1.06E-05	6.74E+03	6.54E-02	1.60E-03	25	363.15	585.85	7,800	3.7E-05	7.0E-02	1.64E+02	?	X
75296	2-Chloropropane	9.14E+00	8.88E-02	1.01E-05	3.73E+03	5.93E-01	1.45E-02	25	308.70	485.00	6,286	0.0E+00	1.0E-01	7.85E+01		
75343	1,1-Dichloroethane	3.16E+01	7.42E-02	1.05E-05	5.06E+03	2.30E-01	5.61E-03	25	330.55	523.00	6,895	1.6E-06	5.0E-01	9.90E+01		
75354	1,1-Dichloroethylene	5.89E+01	9.00E-02	1.04E-05	2.25E+03	1.07E+00	2.60E-02	25	304.75	576.05	6,247	0.0E+00	7.0E-02	9.69E+01		
75456	Chlorodifluoromethane	4.79E+01	1.01E-01	1.28E-05	2.00E+00	1.10E+00	2.70E-02	25	232.40	369.30	4,836	0.0E+00	5.0E+01	8.65E+01		
75694	Trichlorofluoromethane	4.97E+02	8.70E-02	9.70E-06	1.10E+03	3.97E+00	9.68E-02	25	296.70	471.00	5,999	0.0E+00	7.0E-01	1.37E+02		
75718	Dichlorodifluoromethane	4.57E+02	6.65E-02	9.92E-06	2.80E+02	1.40E+01	3.42E-01	25	243.20	384.95	9,421	0.0E+00	2.0E-01	1.21E+02		
76131	1,1,2-Trichloro-1,2,2-trifluoroethane	1.11E+04	7.80E-02	8.20E-06	1.70E+02	1.97E+01	4.80E-01	25	320.70	487.30	6,463	0.0E+00	3.0E+01	1.87E+02		
76448	Heptachlor	1.41E+06	1.12E-02	5.69E-06	1.80E-01	6.05E+01	1.48E+00	25	603.69	846.31	13,000	1.6E-03	1.8E-03	3.73E+02		X
77474	Hexachlorocyclopentadiene	2.00E+05	1.61E-02	7.21E-06	1.80E+00	1.10E+00	2.69E-02	25	512.15	746.00	10,931	0.0E+00	2.0E-04	2.73E+02		
78831	Isobutanol	2.59E+00	8.60E-02	9.30E-06	8.50E+04	4.83E-04	1.18E-05	25	381.04	547.78	10,936	0.0E+00	1.1E+00	7.41E+01		X
78875	1,2-Dichloropropane	4.37E+01	7.82E-02	8.73E-06	2.80E+03	1.15E-01	2.79E-03	25	369.52	572.00	7,590	1.0E-05	4.0E-03	1.13E+02	?	
78933	Methylethylketone (2-butanone)	2.30E+00	8.08E-02	9.80E-06	2.23E+05	2.29E-03	5.58E-05	25	352.50	536.78	7,481	0.0E+00	5.0E+00	7.21E+01		
79005	1,1,2-Trichloroethane	5.01E+01	7.80E-02	8.80E-06	4.42E+03	3.73E-02	9.11E-04	25	386.15	602.00	8,322	1.6E-05	1.4E-02	1.33E+02		X
79016	Trichloroethylene	1.66E+02	7.90E-02	9.10E-06	1.47E+03	4.21E-01	1.03E-02	25	360.36	544.20	7,505	2.0E-06	6.0E-01	1.31E+02	?	
79209	Methyl acetate	3.26E+00	1.04E-01	1.00E-05	2.00E+03	4.84E-03	1.18E-04	25	329.80	506.70	7,260	0.0E+00	3.5E+00	7.41E+01		X
79345	1,1,2,2-Tetrachloroethane	9.33E+01	7.10E-02	7.90E-06	2.96E+03	1.41E-02	3.44E-04	25	419.60	661.15	8,996	5.8E-05	2.1E-01	1.68E+02		X
79469	2-Nitropropane	1.17E+01	9.23E-02	1.01E-05	1.70E+04	5.03E-03	1.23E-04	25	393.20	594.00	8,383	2.7E-03	2.0E-02	8.91E+01		
80626	Methylmethacrylate	6.98E+00	7.70E-02	8.60E-06	1.50E+04	1.38E-02	3.36E-04	25	373.50	567.00	8,975	0.0E+00	7.0E-01	1.00E+02		
83329	Acenaphthene	7.08E+03	4.21E-02	7.69E-06	3.57E+00	6.34E-03	1.55E-04	25	550.54	803.15	12,155	0.0E+00	2.1E-01	1.54E+02		X
86737	Fluorene	1.38E+04	3.63E-02	7.88E-06	1.98E+00	2.60E-03	6.34E-05	25	570.44	870.00	12,666	0.0E+00	1.4E-01	1.66E+02		X
87683	Hexachloro-1,3-butadiene	5.37E+04	5.61E-02	6.16E-06	3.20E+00	3.33E-01	8.13E-03	25	486.15	738.00	10,206	2.2E-05	7.0E-04	2.61E+02		X
88722	o-Nitrotoluene	3.24E+02	5.87E-02	8.67E-06	6.50E+02	5.11E-04	1.25E-05	25	495.00	720.00	12,239	0.0E+00	3.5E-02	1.37E+02		X
91203	Naphthalene	2.00E+03	5.90E-02	7.50E-06	3.10E+01	1.98E-02	4.82E-04	25	491.14	748.40	10,373	3.4E-05	3.0E-03	1.28E+02		
91576	2-Methylnaphthalene	2.81E+03	5.22E-02	7.75E-06	2.46E+01	2.12E-02	5.17E-04	25	514.26	761.00	12,600	0.0E+00	7.0E-02	1.42E+02		X
92524	Biphenyl	4.38E+03	4.04E-02	8.15E-06	7.45E+00	1.23E-02	2.99E-04	25	529.10	789.00	10,890	0.0E+00	1.8E-01	1.54E+02		X
95476	o-Xylene	3.63E+02	8.70E-02	1.00E-05	1.78E+02	2.12E-01	5.18E-03	25	417.60	630.30	8,661	0.0E+00	1.0E-01	1.06E+02		?
95501	1,2-Dichlorobenzene	6.17E+02	6.90E-02	7.90E-06	1.56E+02	7.77E-02	1.90E-03	25	453.57	705.00	9,700	0.0E+00	2.0E-01	1.47E+02		

VLOOKUP TABLES

CAS No.	Chemical	Chemical Properties Lookup Table												URF extrapolated (X)	RfC extrapolated (X)
		Organic carbon partition coefficient, $K_{oc}$ (cm <sup>3</sup> /g)	Diffusivity in air, $D_a$ (cm <sup>2</sup> /s)	Diffusivity in water, $D_w$ (cm <sup>2</sup> /s)	Pure component water solubility, $S$ (mg/L)	Henry's law constant $H'$ (unitless)	Henry's law constant at reference temperature, $H$ (atm·m <sup>3</sup> /mol)	Henry's law constant reference temperature, $T_R$ (°C)	Normal boiling point, $T_B$ (°K)	Critical temperature, $T_C$ (°K)	Enthalpy of vaporization at the normal boiling point, $\Delta H_{v,b}$ (cal/mol)	Unit risk factor, URF ( $\mu\text{g}/\text{m}^3$ ) <sup>-1</sup>	Reference conc., RfC (mg/m <sup>3</sup> )		
95578	2-Chlorophenol	3.88E+02	5.01E-02	9.46E-06	2.20E+04	1.60E-02	3.90E-04	25	447.53	675.00	9,572	0.0E+00	1.8E-02	1.29E+02	X
95636	1,2,4-Trimethylbenzene	1.35E+03	6.06E-02	7.92E-06	5.70E+01	2.52E-01	6.14E-03	25	442.30	649.17	9,369	0.0E+00	6.0E-03	1.20E+02	
96184	1,2,3-Trichloropropane	2.20E+01	7.10E-02	7.90E-06	1.75E+03	1.67E-02	4.08E-04	25	430.00	652.00	9,171	5.7E-04	4.9E-03	1.47E+02	X
96333	Methyl acrylate	4.53E+00	9.76E-02	1.02E-05	6.00E+04	7.68E-03	1.87E-04	25	353.70	536.00	7,749	0.0E+00	1.1E-01	8.61E+01	X
97632	Ethylmethacrylate	2.95E+01	6.53E-02	8.37E-06	3.67E+03	3.44E-02	8.40E-04	25	390.00	571.00	10,957	0.0E+00	3.2E-01	1.14E+02	X
98066	tert-Butylbenzene	7.71E+02	5.65E-02	8.02E-06	2.95E+01	4.87E-01	1.19E-02	25	442.10	1220.00	8,980	0.0E+00	1.4E-01	1.34E+02	X
98828	Cumene	4.89E+02	6.50E-02	7.10E-06	6.13E+01	4.74E+01	1.16E+00	25	425.56	631.10	10,335	0.0E+00	4.0E-01	1.20E+02	
98862	Acetophenone	5.77E+01	6.00E-02	8.73E-06	6.13E+03	4.38E-04	1.07E-05	25	475.00	709.50	11,732	0.0E+00	3.5E-01	1.20E+02	X
98953	Nitrobenzene	6.46E+01	7.60E-02	8.60E-06	2.09E+03	9.82E-04	2.39E-05	25	483.95	719.00	10,566	0.0E+00	2.0E-03	1.23E+02	
100414	Ethylbenzene	3.63E+02	7.50E-02	7.80E-06	1.69E+02	3.22E-01	7.86E-03	25	409.34	617.20	8,501	0.0E+00	1.0E+00	1.06E+02	
100425	Styrene	7.76E+02	7.10E-02	8.00E-06	3.10E+02	1.12E-01	2.74E-03	25	418.31	636.00	8,737	0.0E+00	9.0E-01	1.04E+02	
100447	Benzylchloride	6.14E+01	7.50E-02	7.80E-06	5.25E+02	1.70E-02	4.14E-04	25	452.00	685.00	8,773	4.9E-05	0.0E+00	1.27E+02	?
100527	Benzaldehyde	4.59E+01	7.21E-02	9.07E-06	3.30E+03	9.73E-04	2.37E-05	25	452.00	695.00	11,658	0.0E+00	3.5E-01	1.06E+02	X
103651	n-Propylbenzene	5.62E+02	6.01E-02	7.83E-06	6.00E+01	4.37E-01	1.07E-02	25	432.20	630.00	9,123	0.0E+00	1.4E-01	1.20E+02	X
104518	n-Butylbenzene	1.11E+03	5.70E-02	8.12E-06	2.00E+00	5.38E-01	1.31E-02	25	456.46	660.50	9,290	0.0E+00	1.4E-01	1.34E+02	X
106423	p-Xylene	3.89E+02	7.69E-02	8.44E-06	1.85E+02	3.13E-01	7.64E-03	25	411.52	616.20	8,525	0.0E+00	1.0E-01	1.06E+02	?
106467	1,4-Dichlorobenzene	6.17E+02	6.90E-02	7.90E-06	7.90E+01	9.82E-02	2.39E-03	25	447.21	684.75	9,271	1.1E-05	8.0E-01	1.47E+02	
106934	1,2-Dibromoethane (ethylene dibromide)	2.50E+01	2.17E-02	1.19E-05	4.18E+03	3.04E-02	7.41E-04	25	404.60	583.00	8,310	7.1E-05	8.0E-04	1.88E+02	
106990	1,3-Butadiene	1.91E+01	2.49E-01	1.08E-05	7.35E+02	3.01E+00	7.34E-02	25	268.60	425.00	5,370	1.7E-04	2.0E-03	5.41E+01	
107028	Acrolein	2.76E+00	1.05E-01	1.22E-05	2.13E+05	4.99E-03	1.22E-04	25	325.60	506.00	6,731	0.0E+00	2.0E-05	5.61E+01	
107062	1,2-Dichloroethane	1.74E+01	1.04E-01	9.90E-06	8.52E+03	4.00E-02	9.77E-04	25	356.65	561.00	7,643	2.1E-05	4.0E-01	9.90E+01	
107131	Acrylonitrile	5.90E+00	1.22E-01	1.34E-05	7.40E+04	4.21E-03	1.03E-04	25	350.30	519.00	7,786	2.9E-04	2.0E-03	5.31E+01	
108054	Vinyl acetate	5.25E+00	8.50E-02	9.20E-06	2.00E+04	2.09E-02	5.10E-04	25	345.65	519.13	7,800	0.0E+00	2.0E-01	8.61E+01	
108101	Methylisobutylketone (4-methyl-2-pentanone)	9.06E+00	7.50E-02	7.80E-06	1.90E+04	5.64E-03	1.38E-04	25	389.50	571.00	8,243	0.0E+00	8.0E-02	1.00E+02	
108383	m-Xylene	4.07E+02	7.00E-02	7.80E-06	1.61E+02	3.00E-01	7.32E-03	25	412.27	617.05	8,523	0.0E+00	1.0E-01	1.06E+02	?
108678	1,3,5-Trimethylbenzene	1.35E+03	6.02E-02	8.67E-06	2.00E+00	2.41E-01	5.87E-03	25	437.89	637.25	9,321	0.0E+00	6.0E-03	1.20E+02	
108872	Methylcyclohexane	7.85E+01	7.35E-02	8.52E-06	1.40E+01	4.22E+00	1.03E-01	25	373.90	572.20	7,474	0.0E+00	3.0E+00	9.82E+01	
108883	Toluene	1.82E+02	8.70E-02	8.60E-06	5.26E+02	2.72E-01	6.62E-03	25	383.78	591.79	7,930	0.0E+00	3.0E-01	9.21E+01	
108907	Chlorobenzene	2.19E+02	7.30E-02	8.70E-06	4.72E+02	1.51E-01	3.69E-03	25	404.87	632.40	8,410	0.0E+00	1.0E+00	1.13E+02	
109693	1-Chlorobutane	1.72E+01	8.26E-02	1.00E-05	1.10E+03	6.93E-01	1.69E-02	25	351.60	542.00	7,263	0.0E+00	1.4E+00	9.26E+01	X
109999	TETRAHYDROFURAN	1.00E+00	9.80E-02	1.05E-05	1.00E+06		4.90E-05	25	340.15	540.10	7,125	1.9E-06	3.0E-01	7.21E+01	
110009	Furan	1.86E+01	1.04E-01	1.22E-05	1.00E+04	2.21E-01	5.39E-03	25	304.60	490.20	6,477	0.0E+00	3.5E-03	6.81E+01	X
110543	Hexane	4.34E+01	2.00E-01	7.77E-06	1.24E+01	6.82E+01	1.66E+00	25	341.70	508.00	6,895	0.0E+00	2.0E-01	8.62E+01	
110827	CYCLOHEXANE		8.39E-02	9.10E-06	5.50E+01		1.37E-02	25	353.85	553.50	10,350	0.0E+00	6.0E+00	8.42E+01	
111444	Bis(2-chloroethyl)ether	1.55E+01	6.92E-02	7.53E-06	1.72E+04	7.36E-04	1.80E-05	25	451.15	659.79	10,803	7.1E-04	0.0E+00	1.43E+02	
115297	Endosulfan	2.14E+03	1.15E-02	4.55E-06	5.10E-01	4.58E-04	1.12E-05	25	674.43	942.94	14,000	0.0E+00	2.1E-02	4.07E+02	X
118741	Hexachlorobenzene	5.50E+04	5.42E-02	5.91E-06	5.00E-03	5.40E-02	1.32E-03	25	582.55	825.00	14,447	5.1E-04	2.8E-03	2.85E+02	X
120821	1,2,4-Trichlorobenzene	1.78E+03	3.00E-02	8.23E-06	4.88E+01	5.81E-02	1.42E-03	25	486.15	725.00	10,471	0.0E+00	2.0E-01	1.81E+02	
123739	Crotonaldehyde (2-butenal)	4.82E+00	9.56E-02	1.07E-05	3.69E+04	7.99E-04	1.95E-05	25	375.20	568.00	9	5.4E-04	0.0E+00	7.01E+01	X
124481	Chlorodibromomethane	6.31E+01	1.96E-02	1.05E-05	2.60E+03	3.20E-02	7.81E-04	25	416.14	678.20	5,900	2.7E-05	7.0E-02	2.08E+02	?
126987	Methacrylonitrile	3.58E+01	1.12E-01	1.32E-05	2.54E+04	1.01E-02	2.46E-04	25	363.30	554.00	7,600	0.0E+00	7.0E-04	6.71E+01	X
126998	2-Chloro-1,3-butadiene (chloroprene)	6.73E+01	8.58E-02	1.03E-05	2.12E+03	4.91E-01	1.20E-02	25	332.4	525	8074.848	0.0E+00	7.0E-03	8.85E+01	
127184	Tetrachloroethylene	1.55E+02	7.20E-02	8.20E-06	2.00E+02	7.53E-01	1.84E-02	25	394.4	620.2	8288	5.9E-06	3.5E-02	1.66E+02	
129000	Pyrene	1.05E+05	2.72E-02	7.24E-06	1.35E+00	4.50E-04	1.10E-05	25	667.95	936	14370	0.0E+00	1.1E-01	2.02E+02	X
132649	Dibenzofuran	5.15E+03	2.38E-02	6.00E-06	3.10E+00	5.15E-04	1.26E-05	25	560	824	66400	0.0E+00	1.4E-02	1.68E+02	X
135988	sec-Butylbenzene	9.66E+02	5.70E-02	8.12E-06	3.94E+00	5.68E-01	1.39E-02	25	446.5	679	88730	0.0E+00	1.4E-01	1.34E+02	X
141786	Ethylacetate	6.44E+00	7.32E-02	9.70E-06	8.03E+04	5.64E-03	1.38E-04	25	350.26	523.3	7633.66	0.0E+00	3.2E+00	8.81E+01	X
156592	cis-1,2-Dichloroethylene	3.55E+01	7.36E-02	1.13E-05	3.50E+03	1.67E-01	4.07E-03	25	333.65	544	7192	0.0E+00	3.5E-02	9.69E+01	X
156605	trans-1,2-Dichloroethylene	5.25E+01	7.07E-02	1.19E-05	6.30E+03	3.84E-01	9.36E-03	25	320.85	516.5	6717	0.0E+00	7.0E-02	9.69E+01	X
205992	Benzo(b)fluoranthene	1.23E+06	2.26E-02	5.56E-06	1.50E-03	4.54E-03	1.11E-04	25	715.9	969.27	17000	1.1E-04	0.0E+00	2.52E+02	?
218019	Chrysene	3.98E+05	2.48E-02	6.21E-06	6.30E-03	3.87E-03	9.44E-05	25	714.15	979	16455	1.1E-05	0.0E+00	2.28E+02	?
309002	Aldrin	2.45E+06	1.32E-02	4.86E-06	1.70E-02	6.95E-03	1.70E-04	25	603.01	839.37	15000	4.9E-03	1.1E-04	3.65E+02	X
319846	alpha-HCH (alpha-BHC)	1.23E+03	1.42E-02	7.34E-06	2.00E+00	4.34E-04	1.06E-05	25	596.55	839.36	15000	7.7E-04	0.0E+00	2.91E+02	
541731	1,3-Dichlorobenzene	1.98E+03	6.92E-02	7.86E-06	1.34E+02	1.27E-01	3.09E-03	25	446	684	9230.18	0.0E+00	1.1E-01	1.47E+02	X
542756	1,3-Dichloropropene	4.57E+01	6.26E-02	1.00E-05	2.80E+03	7.24E-01	1.77E-02	25	381.15	587.38	7900	1.6E-05	2.0E-02	1.11E+02	
630206	1,1,1,2-Tetrachloroethane	1.16E+02	7.10E-02	7.90E-06	1.10E+03	9.90E-02	2.41E-03	25	403.5	624	9768.282525	7.4E-06	1.1E-01	1.68E+02	X
1634044	MTBE	7.26E+00	1.02E-01	1.05E-05	5.10E+04	2.56E-02	6.23E-04	25	328.3	497.1	6677.66	2.6E-07	3.0E+00	8.82E+01	
7439976	Mercury (elemental)	5.20E+01	3.07E-02	6.30E-06	2.00E+01	4.40E-01	1.07E-02	25	629.88	1750	14127	0.0E+00	9.0E-05	2.01E+02	

**Appendix A-5**  
**HBRG Calculations**

TABLE A5-1.1 CTE  
 CALCULATION OF CARCINOGENIC AND NON-CARCINOGENIC HBRGS FOR COPCs  
 Industrial Worker - Central Tendency Exposure  
 Omega Chemical Site - Whittier, California

Scenario Timeframe:	Current/Future
Receptor Population:	Industrial Worker
Receptor Age:	Adult

Cancer Intake Factor		Noncancer Intake Factor	
Surface Soil		Surface Soil	
Ingestion:	1.7E-07	Ingestion:	4.9E-07
Dermal:	2.3E-06	Dermal:	6.5E-06
Inhalation of soil vapor:	3.4E-02	Inhalation of soil vapor:	9.4E-02
Groundwater		Groundwater	
Inhalation of soil vapor:	3.4E-02	Inhalation of soil vapor:	9.4E-02
Target Risk	1.00E-06	Target Hazard Quotient	1

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	Target		Cancer Risk Calculations					Non-Cancer Hazard Calculations					
					Risk	Hazard	Target Risk/Intake Factor		CSF		Cancer HBRG	Target Hazard/Intake Factor		RfD		Hazard HBRG	
							Value	Units	Value	Units		Value	Units	Value	Units		
Soil	Surface Soil	Surface Soil at Site	Ingestion	BIS(2-ETHYLHEXYL)PHTHALATE	1.0E-06	1	5.7E+00	mg/kg/day <sup>-1</sup>	1.4E-02	mg/kg/day <sup>-1</sup>	4.1E+02	2.0E+06	mg/kg/day <sup>-1</sup>	2.0E-02	mg/kg/day	4.1E+04	
				PCB-1254 (AROCOR 1254)	1.0E-06	1	5.7E+00	mg/kg/day <sup>-1</sup>	5.0E+00	mg/kg/day <sup>-1</sup>	1.1E+00	2.0E+06	mg/kg/day <sup>-1</sup>	2.0E-05	mg/kg/day	4.1E+01	
			Exp. Route Total		2.0E-06	2.0E+00											
			Dermal	BIS(2-ETHYLHEXYL)PHTHALATE	1.0E-06	1	4.3E-01	mg/kg/day <sup>-1</sup>	1.4E-03	mg/kg/day <sup>-1</sup>	3.1E+02	1.5E+05	mg/kg/day <sup>-1</sup>	2.0E-01	mg/kg/day	3.1E+04	
				PCB-1254 (AROCOR 1254)	1.0E-06	1	4.3E-01	mg/kg/day <sup>-1</sup>	7.5E-01	mg/kg/day <sup>-1</sup>	5.8E-01	1.5E+05	mg/kg/day <sup>-1</sup>	1.3E-04	mg/kg/day	2.1E+01	
		Exp. Route Total		2.0E-06	2.0E+00					mg/kg					mg/kg		
		Exposure Point Total		4.0E-06	4.0E+00												
Surface Soil Total					4.0E-06	4E+00											
Indoor Air	Indoor Air	Indoor Air	Inhalation	1,1-DICHLOROETHENE	---	1	---	mg/kg/day <sup>-1</sup>	NA	mg/kg/day <sup>-1</sup>	---	1.1E+01	mg/kg/day <sup>-1</sup>	5.7E-02	mg/kg/day	6.1E+02	
				1,2-DICHLOROETHANE	1.0E-06	1	3.0E-05	mg/kg/day <sup>-1</sup>	9.1E-02	mg/kg/day <sup>-1</sup>	3.3E-01	1.1E+01	mg/kg/day <sup>-1</sup>	1.4E-03	mg/kg/day	1.5E+01	
				1,4-DICHLOROBENZENE	1.0E-06	1	3.0E-05	mg/kg/day <sup>-1</sup>	4.0E-02	mg/kg/day <sup>-1</sup>	7.5E-01	1.1E+01	mg/kg/day <sup>-1</sup>	2.3E-01	mg/kg/day	2.4E+03	
				ACETONE	---	1	---	mg/kg/day <sup>-1</sup>	NA	mg/kg/day <sup>-1</sup>	---	1.1E+01	mg/kg/day <sup>-1</sup>	9.0E-01	mg/kg/day	9.6E+03	
				BENZENE	1.0E-06	1	3.0E-05	mg/kg/day <sup>-1</sup>	1.0E-01	mg/kg/day <sup>-1</sup>	3.0E-01	1.1E+01	mg/kg/day <sup>-1</sup>	8.6E-03	mg/kg/day	9.1E+01	
				CARBON TETRACHLORIDE	1.0E-06	1	3.0E-05	mg/kg/day <sup>-1</sup>	1.5E-01	mg/kg/day <sup>-1</sup>	2.0E-01	1.1E+01	mg/kg/day <sup>-1</sup>	1.1E-02	mg/kg/day	1.2E+02	
				CHLOROFORM	1.0E-06	1	3.0E-05	mg/kg/day <sup>-1</sup>	8.1E-02	mg/kg/day <sup>-1</sup>	3.7E-01	1.1E+01	mg/kg/day <sup>-1</sup>	8.6E-02	mg/kg/day	9.1E+02	
				METHYLENE CHLORIDE	1.0E-06	1	3.0E-05	mg/kg/day <sup>-1</sup>	3.5E-03	mg/kg/day <sup>-1</sup>	8.5E+00	1.1E+01	mg/kg/day <sup>-1</sup>	1.1E-01	mg/kg/day	1.2E+03	
				TETRACHLOROETHENE	1.0E-06	1	3.0E-05	mg/kg/day <sup>-1</sup>	2.1E-02	mg/kg/day <sup>-1</sup>	1.4E+00	1.1E+01	mg/kg/day <sup>-1</sup>	1.0E-02	mg/kg/day	1.1E+02	
				TOLUENE	---	1	---	mg/kg/day <sup>-1</sup>	NA	mg/kg/day <sup>-1</sup>	---	1.1E+01	mg/kg/day <sup>-1</sup>	8.6E-02	mg/kg/day	9.1E+02	
				TRICHLOROETHENE	1.0E-06	1	3.0E-05	mg/kg/day <sup>-1</sup>	7.0E-03	mg/kg/day <sup>-1</sup>	4.3E+00	1.1E+01	mg/kg/day <sup>-1</sup>	1.7E-01	mg/kg/day	1.8E+03	
		Exp. Route Total		8.0E-06	1.1E+01					ug/m <sup>3</sup>					ug/m <sup>3</sup>		
		Exposure Point Total		8.0E-06	1E+01												
Indoor Air Total					8.0E-06	1E+01											
					#REF!	#REF!	Total of Receptor Risks Across All Media					Total of Receptor Hazards Across All Media					

NA: Not applicable.

HBRG: Health based risk goal

---: Risk was not calculated for chemical.

mg/kg: milligram per kilogram.

mg/kg/day: milligram per kilogram per day.

mg/kg/day<sup>-1</sup>: milligram per kilogram-day.

TABLE A5-1.2 RME  
 CALCULATION OF CARCINOGENIC AND NON-CARCINOGENIC HBRGS FOR COPCs  
 Industrial Worker - Reasonable Maximum Exposure  
 Omega Chemical Site - Whittier, California

Scenario Timeframe:	Current/Future
Receptor Population:	Industrial Worker
Receptor Age:	Adult

Cancer Intake Factor		Noncancer Intake Factor	
Surface Soil		Surface Soil	
Ingestion:	1.7E-07	Ingestion:	4.9E-07
Dermal:	2.3E-06	Dermal:	6.5E-06
Inhalation of soil vapor:	3.4E-02	Inhalation of soil vapor:	9.4E-02
Groundwater		Groundwater	
Inhalation of soil vapor:	3.4E-02	Inhalation of soil vapor:	9.4E-02
Target Risk	1.00E-06	Target Hazard Quotient	1

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	Target		Cancer Risk Calculations					Non-Cancer Hazard Calculations					
					Risk	Hazard	Target Risk/Intake Factor		CSF		Cancer HBRG	Target Hazard/Intake Factor		RfD		Hazard HBRG	
							Value	Units	Value	Units		Value	Units	Value	Units		
Soil	Surface Soil	Surface Soil at Site	Ingestion	BIS(2-ETHYLHEXYL)PHTHALATE	1.0E-06	1	5.7E+00	mg/kg/day <sup>-1</sup>	1.4E-02	mg/kg/day <sup>-1</sup>	4.1E+02	2.0E+06	mg/kg/day <sup>-1</sup>	2.0E-02	mg/kg/day	4.1E+04	
				DIELDRIN	1.0E-06	1	5.7E+00	mg/kg/day <sup>-1</sup>	1.6E+01	mg/kg/day <sup>-1</sup>	3.6E-01	2.0E+06	mg/kg/day <sup>-1</sup>	5.0E-05	mg/kg/day	1.0E+02	
				LEAD	1.0E-06	---	5.7E+00	mg/kg/day <sup>-1</sup>	8.5E-03	mg/kg/day <sup>-1</sup>	6.7E+02	---	mg/kg/day <sup>-1</sup>	NA	mg/kg/day	---	
				NAPHTHALENE	1.0E-06	1	5.7E+00	mg/kg/day <sup>-1</sup>	1.2E-01	mg/kg/day <sup>-1</sup>	4.8E+01	2.0E+06	mg/kg/day <sup>-1</sup>	2.0E-02	mg/kg/day	4.1E+04	
				PCB-1254 (AROCLOR 1254)	1.0E-06	1	5.7E+00	mg/kg/day <sup>-1</sup>	5.0E+00	mg/kg/day <sup>-1</sup>	1.1E+00	2.0E+06	mg/kg/day <sup>-1</sup>	2.0E-05	mg/kg/day	4.1E+01	
			Exp. Route Total			5.0E-06	4.0E+00										
			Dermal	BIS(2-ETHYLHEXYL)PHTHALATE	1.0E-06	1	4.3E-01	mg/kg/day <sup>-1</sup>	1.4E-03	mg/kg/day <sup>-1</sup>	3.1E+02	1.5E+05	mg/kg/day <sup>-1</sup>	2.0E-01	mg/kg/day	3.1E+04	
				DIELDRIN	1.0E-06	1	4.3E-01	mg/kg/day <sup>-1</sup>	8.0E-01	mg/kg/day <sup>-1</sup>	5.4E-01	1.5E+05	mg/kg/day <sup>-1</sup>	1.0E-03	mg/kg/day	1.5E+02	
				LEAD	1.0E-06	---	4.3E-01	mg/kg/day <sup>-1</sup>	8.5E-05	mg/kg/day <sup>-1</sup>	5.1E+03	---	mg/kg/day <sup>-1</sup>	NA	mg/kg/day	---	
				NAPHTHALENE	1.0E-06	1	4.3E-01	mg/kg/day <sup>-1</sup>	1.8E-02	mg/kg/day <sup>-1</sup>	2.4E+01	1.5E+05	mg/kg/day <sup>-1</sup>	1.3E-01	mg/kg/day	2.1E+04	
				PCB-1254 (AROCLOR 1254)	1.0E-06	1	4.3E-01	mg/kg/day <sup>-1</sup>	7.5E-01	mg/kg/day <sup>-1</sup>	5.8E-01	1.5E+05	mg/kg/day <sup>-1</sup>	1.3E-04	mg/kg/day	2.1E+01	
			Exp. Route Total			5.0E-06	4.0E+00			mg/kg						mg/kg	
Exposure Point Total				1.0E-05	8.0E+00												
Surface Soil Total					1.0E-05	8E+00											
Indoor Air	Indoor Air	Indoor Air	Inhalation	1,1-DICHLOROETHENE	---	1	---	mg/kg/day <sup>-1</sup>	NA	mg/kg/day <sup>-1</sup>	---	1.1E+01	mg/kg/day <sup>-1</sup>	5.7E-02	mg/kg/day	6.1E+02	
				1,2-DICHLOROETHANE	1.0E-06	1	3.0E-05	mg/kg/day <sup>-1</sup>	9.1E-02	mg/kg/day <sup>-1</sup>	3.3E-01	1.1E+01	mg/kg/day <sup>-1</sup>	1.4E-03	mg/kg/day	1.5E+01	
				1,4-DICHLOROBENZENE	1.0E-06	1	3.0E-05	mg/kg/day <sup>-1</sup>	4.0E-02	mg/kg/day <sup>-1</sup>	7.5E-01	1.1E+01	mg/kg/day <sup>-1</sup>	2.3E-01	mg/kg/day	2.4E+03	
				ACETONE	---	1	---	mg/kg/day <sup>-1</sup>	NA	mg/kg/day <sup>-1</sup>	---	1.1E+01	mg/kg/day <sup>-1</sup>	9.0E-01	mg/kg/day	9.6E+03	
				BENZENE	1.0E-06	1	3.0E-05	mg/kg/day <sup>-1</sup>	1.0E-01	mg/kg/day <sup>-1</sup>	3.0E-01	1.1E+01	mg/kg/day <sup>-1</sup>	8.6E-03	mg/kg/day	9.1E+01	
				CARBON TETRACHLORIDE	1.0E-06	1	3.0E-05	mg/kg/day <sup>-1</sup>	1.5E-01	mg/kg/day <sup>-1</sup>	2.0E-01	1.1E+01	mg/kg/day <sup>-1</sup>	1.1E-02	mg/kg/day	1.2E+02	
				CHLOROFORM	1.0E-06	1	3.0E-05	mg/kg/day <sup>-1</sup>	8.1E-02	mg/kg/day <sup>-1</sup>	3.7E-01	1.1E+01	mg/kg/day <sup>-1</sup>	8.6E-02	mg/kg/day	9.1E+02	
				METHYLENE CHLORIDE	1.0E-06	1	3.0E-05	mg/kg/day <sup>-1</sup>	3.5E-03	mg/kg/day <sup>-1</sup>	8.5E+00	1.1E+01	mg/kg/day <sup>-1</sup>	1.1E-01	mg/kg/day	1.2E+03	
				TETRACHLOROETHENE	1.0E-06	1	3.0E-05	mg/kg/day <sup>-1</sup>	2.1E-02	mg/kg/day <sup>-1</sup>	1.4E+00	1.1E+01	mg/kg/day <sup>-1</sup>	1.0E-02	mg/kg/day	1.1E+02	
				TOLUENE	---	1	---	mg/kg/day <sup>-1</sup>	NA	mg/kg/day <sup>-1</sup>	---	1.1E+01	mg/kg/day <sup>-1</sup>	8.6E-02	mg/kg/day	9.1E+02	
				TRICHLOROETHENE	1.0E-06	1	3.0E-05	mg/kg/day <sup>-1</sup>	7.0E-03	mg/kg/day <sup>-1</sup>	4.3E+00	1.1E+01	mg/kg/day <sup>-1</sup>	1.7E-01	mg/kg/day	1.8E+03	
				Exp. Route Total			8.0E-06	1.1E+01			ug/m <sup>3</sup>						ug/m <sup>3</sup>
Exposure Point Total				8.0E-06	1E+01												
Indoor Air Total					8.0E-06	1E+01											
					1.8E-05	1.9E+01	Total of Receptor Hazards Across All Media				Total of Receptor Hazards Across All Media						

NA: Not applicable.

HBRG: Health based risk goal

---: Risk was not calculated for chemical.

mg/kg: milligram per kilogram.

mg/kg/day: milligram per kilogram per day.

mg/kg/day<sup>-1</sup>: milligram per kilogram-day.

TABLE A5-1.3 CTE  
 CALCULATION OF CARCINOGENIC AND NON-CARCINOGENIC HBRGS FOR COPCs  
 Construction Worker - Central Tendency Exposure  
 Omega Chemical Site - Whittier, California

Scenario Timeframe:	Current/Future
Receptor Population:	Construction Worker - CTE
Receptor Age:	Adult

Cancer Intake Factor				Noncancer Intake Factor			
Surface Soil				Surface Soil			
Ingestion:		3.4E-09		Ingestion:		2.3E-07	
Dermal:		4.1E-08		Dermal:		2.9E-06	
Inhalation of fugitive dust:		6.2E-13		Inhalation of fugitive dust:		4.3E-11	
Target Risk		1.00E-06		Target Hazard Quotient		1	

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	Target		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Risk	Hazard	Target Risk/Intake Factor		CSF		Cancer HBRG	Target Risk/Intake Factor		RfD		Hazard HBRG
							Value	Units	Value	Units		Value	Units	Value	Units	
Soil	Surface and Subsurface Soil to 30' bgs	Surface and Subsurface Soil	Ingestion	BENZO(A)PYRENE	1.0E-06	---	3.0E+02	mg/kg/day	1.2E+01	mg/kg/day <sup>-1</sup>	2.5E+01	---	mg/kg/day	NA	mg/kg/day	---
				TETRACHLOROETHENE	1.0E-06	1.0	3.0E+02	mg/kg/day	5.4E-01	mg/kg/day <sup>-1</sup>	5.5E+02	4.3E+06	mg/kg/day	1.0E-02	mg/kg/day	4.3E+04
			Exp. Route Total		2.00E-06	1.00E+00						mg/kg				mg/kg
			Dermal	BENZO(A)PYRENE	1.0E-06	---	2.4E+01	mg/kg/day	1.8E+00	mg/kg/day <sup>-1</sup>	1.4E+01	---	mg/kg/day	NA	mg/kg/day	---
			TETRACHLOROETHENE	1.0E-06	1.0	2.4E+01	mg/kg/day	5.4E-02	mg/kg/day <sup>-1</sup>	4.5E+02	3.5E+05	mg/kg/day	1.0E-01	mg/kg/day	3.5E+04	
		Exp. Route Total		2.00E-06	1.00E+00						mg/kg				mg/kg	
		Exposure Point Total		4.00E-06	2.00E+00											
		Fugitive Dust	Inhalation	BENZO(A)PYRENE	1.0E-06	---	1.6E+06	mg/kg/day	1.8E+00	mg/kg/day <sup>-1</sup>	9.0E+05	---	mg/kg/day	NA	mg/kg/day	---
				TETRACHLOROETHENE	1.0E-06	1.0	1.6E+06	mg/kg/day	5.4E-02	mg/kg/day <sup>-1</sup>	3.0E+07	2.3E+10	mg/kg/day	1.0E-01	mg/kg/day	2.3E+09
			Exp. Route Total		2.0E-06	1.0E+00						mg/kg				mg/kg
Exposure Point Total		2.0E-06	1.0E+00													
Soil Total		6.0E-06	3.0E+00													
					6.0E-06	3.0E+00	Total of Receptor Risks Across All Media					Total of Receptor Hazards Across All Media				

NA: Not applicable.  
 HBRG: Health based risk goal  
 CTE: central tendency exposure

---: Risk was not calculated for chemical.  
 mg/kg: milligram per kilogram.  
 mg/kg/day: milligram per kilogram per day.  
 mg/kg/day<sup>-1</sup>: milligram per kilogram-day.

TABLE A5-1.4 RME  
 CALCULATION OF CARCINOGENIC AND NON-CARCINOGENIC HBRGS FOR COPCs  
 Construction Worker - Reasonable Maximum Exposure  
 Omega Chemical Site - Whittier, California

Scenario Timeframe:	Current/Future
Receptor Population:	Construction Worker - RME
Receptor Age:	Adult

Cancer Intake Factor		Noncancer Intake Factor	
Surface Soil		Surface Soil	
Ingestion:	1.6E-08	Ingestion:	1.1E-06
Dermal:	4.1E-08	Dermal:	2.9E-06
Inhalation of fugitive dust:	1.2E-12	Inhalation of fugitive dust:	8.3E-11
Target Risk	1.00E-06	Target Hazard Quotient	1

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	Target		Cancer Risk Calculations					Non-Cancer Hazard Calculations					
					Value	Units	Intake/ Exposure Concentration		CSF		Cancer Risk	Intake/ Exposure Concentration		RfD		Hazard Quotient	
							Value	Units	Value	Units		Value	Units	Value	Units		
Soil	Surface and Subsurface Soil to 30' bgs	Surface and Subsurface Soil	Ingestion	BENZO(A)PYRENE	1.0E-06	---	6.2E+01	mg/kg/day	1.2E+01	mg/kg/day <sup>-1</sup>	5.2E+00	---	mg/kg/day	NA	mg/kg/day	---	
				TETRACHLOROETHENE	1.0E-06	1.0	6.2E+01	mg/kg/day	5.4E-01	mg/kg/day <sup>-2</sup>	1.2E+02	8.9E+05	mg/kg/day	1.0E-02	mg/kg/day	8.9E+03	
				TRICHLOROETHENE	1.0E-06	1.0	6.2E+01	mg/kg/day	1.3E-02	mg/kg/day <sup>-1</sup>	4.8E+03	8.9E+05	mg/kg/day	3.0E-04	mg/kg/day	2.7E+02	
		Exp. Route Total				3.00E-06	2.00E+00						mg/kg				
		Dermal	BENZO(A)PYRENE	1.0E-06	---	2.4E+01	mg/kg/day	1.8E+00	mg/kg/day <sup>-1</sup>	1.4E+01	---	mg/kg/day	NA	mg/kg/day	---		
			TETRACHLOROETHENE	1.0E-06	1.0	2.4E+01	mg/kg/day	5.4E-02	mg/kg/day <sup>-2</sup>	4.5E+02	3.5E+05	mg/kg/day	1.0E-01	mg/kg/day	3.5E+04		
	TRICHLOROETHENE		1.0E-06	1.0	2.4E+01	mg/kg/day	1.3E-03	mg/kg/day <sup>-1</sup>	1.9E+04	3.5E+05	mg/kg/day	3.0E-03	mg/kg/day	1.0E+03			
	Exp. Route Total				3.00E-06	2.00E+00						mg/kg					
	Exposure Point Total				6.00E-06	4.00E+00											
	Fugitive Dust	Inhalation	Soil	Inhalation	BENZO(A)PYRENE	1.0E-06	---	8.4E+05	mg/kg/day	1.8E+00	mg/kg/day <sup>-1</sup>	4.7E+05	---	mg/kg/day	NA	mg/kg/day	---
					TETRACHLOROETHENE	1.0E-06	1.0	8.4E+05	mg/kg/day	5.4E-02	mg/kg/day <sup>-2</sup>	1.6E+07	1.2E+10	mg/kg/day	1.0E-01	mg/kg/day	1.2E+09
					TRICHLOROETHENE	1.0E-06	1.0	8.4E+05	mg/kg/day	1.3E-03	mg/kg/day <sup>-1</sup>	6.5E+08	1.2E+10	mg/kg/day	3.0E-03	mg/kg/day	3.6E+07
Exp. Route Total					3.0E-06	2.0E+00						mg/kg					
Exposure Point Total				3.0E-06	2.0E+00												
Soil Total					9.0E-06	6.0E+00											
					9.0E-06	6.0E+00	Total of Receptor Risks Across All Media					Total of Receptor Hazards Across All Media					

NA: Not applicable.  
 RME: reasonable maximum exposure  
 HBRG: Health based risk goal

---: Risk was not calculated for chemical.  
 mg/kg: milligram per kilogram.  
 mg/kg/day: milligram per kilogram per day.  
 mg/kg/day<sup>-1</sup>: milligram per kilogram-day.

TABLE A5-2.1 CTE  
SUMMARY OF CARCINOGENIC AND NON-CARCINOGENIC HBRGS FOR COPCs BY EXPOSURE PATHWAY  
Industrial Worker - Central Tendency Exposure  
Omega Chemical Site - Whittier, California

Scenario Timeframe:	Current/Future
Receptor Population:	Industrial Worker
Receptor:	Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Units	Carcinogenic HBRG				Non-Carcinogenic Hazard HBRG					Minimum HBRG
					Ingestion	Dermal	Inhalation	Exposure Routes Min	Primary Target Organ(s)	Ingestion	Dermal	Inhalation	Exposure Routes Min	
Soil	Surface Soil 0-1.5'	Surface Soil 0-1.5'	BIS(2-ETHYLHEXYL)PHTHALATE	mg/kg	4.1E+02	3.1E+02	NA	3.1E+02	Inc. liver weight	4.1E+04	3.1E+04	NA	3.1E+04	3.1E+02
			PCB-1254 (AROCOLOR 1254)	mg/kg	1.1E+00	5.8E-01	NA	5.8E-01	Ocular exudate	4.1E+01	2.1E+01	NA	2.1E+01	5.8E-01
Indoor Air	Indoor Air	Indoor Air	1,1-DICHLOROETHENE	ug/m <sup>3</sup>	NA	NA	---	---	Liver toxicity	NA	NA	6.1E+02	6.1E+02	6.1E+02
			1,2-DICHLOROETHANE	ug/m <sup>3</sup>	NA	NA	3.3E-01	3.3E-01		NA	NA	1.5E+01	1.5E+01	3.3E-01
			1,4-DICHLOROBENZENE	ug/m <sup>3</sup>	NA	NA	7.5E-01	7.5E-01		NA	NA	2.4E+03	2.4E+03	7.5E-01
			ACETONE	ug/m <sup>3</sup>	NA	NA	---	---	Kidney	NA	NA	9.6E+03	9.6E+03	9.6E+03
			BENZENE	ug/m <sup>3</sup>	NA	NA	3.0E-01	3.0E-01	Dec. lymphocyte count	NA	NA	9.1E+01	9.1E+01	3.0E-01
			CARBON TETRACHLORIDE	ug/m <sup>3</sup>	NA	NA	2.0E-01	2.0E-01	Liver lesions	NA	NA	1.2E+02	1.2E+02	2.0E-01
			CHLOROFORM	ug/m <sup>3</sup>	NA	NA	3.7E-01	3.7E-01	Liver	NA	NA	9.1E+02	9.1E+02	3.7E-01
			METHYLENE CHLORIDE	ug/m <sup>3</sup>	NA	NA	8.5E+00	8.5E+00		NA	NA	1.2E+03	1.2E+03	8.5E+00
			TETRACHLOROETHENE	ug/m <sup>3</sup>	NA	NA	1.4E+00	1.4E+00	Liver toxicity in mice	NA	NA	1.1E+02	1.1E+02	1.4E+00
			TOLUENE	ug/m <sup>3</sup>	NA	NA	---	---	Inc. kidney weight	NA	NA	9.1E+02	9.1E+02	9.1E+02
TRICHLOROETHENE	ug/m <sup>3</sup>	NA	NA	4.3E+00	4.3E+00		NA	NA	1.8E+03	1.8E+03	4.3E+00			

HBRG: Health based risk goal

NA: Not applicable.

---: Risk was not calculated for chemical.

HI: Hazard Index.

CNS: Central Nervous System.

mg/kg: milligram per kilogram.

ug/m<sup>3</sup>: microgram per cubic meter.

TABLE A5-2.2 RME  
SUMMARY OF CARCINOGENIC AND NON-CARCINOGENIC HBRGS FOR COPCs BY EXPOSURE PATHWAY  
Industrial Worker - Reasonable Maximum Exposure  
Omega Chemical Site - Whittier, California

Scenario Timeframe:	Current/Future
Receptor Population:	Industrial Worker
Receptor:	Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Units	Carcinogenic HBRG				Non-Carcinogenic Hazard HBRG					Minimum HBRG
					Ingestion	Dermal	Inhalation	Exposure Routes Min	Primary Target Organ(s)	Ingestion	Dermal	Inhalation	Exposure Routes Min	
Soil	Surface Soil 0-1.5'	Surface Soil 0-1.5'	BIS(2-ETHYLHEXYL)PHTHALATE	mg/kg	4.1E+02	3.1E+02	NA	3.1E+02	Inc. liver weight	4.1E+04	3.1E+04	NA	3.1E+04	3.1E+02
			DIELDRIN	mg/kg	3.6E-01	5.4E-01	NA	3.6E-01	Liver	1.0E+02	1.5E+02	NA	1.0E+02	3.6E-01
			LEAD	mg/kg	6.7E+02	5.1E+03	NA	6.7E+02	---	---	---	NA	---	6.7E+02
			NAPHTHALENE	mg/kg	4.8E+01	2.4E+01	NA	2.4E+01	Dec. body weight in males	4.1E+04	2.1E+04	NA	2.1E+04	2.4E+01
			PCB-1254 (AROCLOL 1254)	mg/kg	1.1E+00	5.8E-01	NA	5.8E-01	Ocular exudate	4.1E+01	2.1E+01	NA	2.1E+01	5.8E-01
Indoor Air	Indoor Air	Indoor Air	1,1-DICHLOROETHENE	ug/m <sup>3</sup>	NA	NA	---	---	Liver toxicity	NA	NA	6.1E+02	6.1E+02	6.1E+02
			1,2-DICHLOROETHANE	ug/m <sup>3</sup>	NA	NA	3.3E-01	3.3E-01	NA	NA	NA	1.5E+01	1.5E+01	3.3E-01
			1,4-DICHLOROBENZENE	ug/m <sup>3</sup>	NA	NA	7.5E-01	7.5E-01	NA	NA	NA	2.4E+03	2.4E+03	7.5E-01
			ACETONE	ug/m <sup>3</sup>	NA	NA	---	---	Kidney	NA	NA	9.6E+03	9.6E+03	9.6E+03
			BENZENE	ug/m <sup>3</sup>	NA	NA	3.0E-01	3.0E-01	Dec. lymphocyte count	NA	NA	9.1E+01	9.1E+01	3.0E-01
			CARBON TETRACHLORIDE	ug/m <sup>3</sup>	NA	NA	2.0E-01	2.0E-01	Liver lesions	NA	NA	1.2E+02	1.2E+02	2.0E-01
			CHLOROFORM	ug/m <sup>3</sup>	NA	NA	3.7E-01	3.7E-01	Liver	NA	NA	9.1E+02	9.1E+02	3.7E-01
			METHYLENE CHLORIDE	ug/m <sup>3</sup>	NA	NA	8.5E+00	8.5E+00	NA	NA	NA	1.2E+03	1.2E+03	8.5E+00
			TETRACHLOROETHENE	ug/m <sup>3</sup>	NA	NA	1.4E+00	1.4E+00	Liver toxicity in mice	NA	NA	1.1E+02	1.1E+02	1.4E+00
			TOLUENE	ug/m <sup>3</sup>	NA	NA	---	---	Inc. kidney weight	NA	NA	9.1E+02	9.1E+02	9.1E+02
			TRICHLOROETHENE	ug/m <sup>3</sup>	NA	NA	4.3E+00	4.3E+00	NA	NA	NA	1.8E+03	1.8E+03	4.3E+00

HBRG: Health based risk goal  
NA: Not applicable.  
---: Risk was not calculated for chemical.  
HI: Hazard Index.  
CNS: Central Nervous System.

mg/kg: milligram per kilogram.  
ug/m<sup>3</sup>: microgram per cubic meter.

TABLE A5-2.3 CTE  
 SUMMARY OF CARCINOGENIC AND NON-CARCINOGENIC HBRGS FOR COPCs BY EXPOSURE PATHWAY  
 Construction Worker - Central Tendency Exposure  
 Omega Chemical Site - Whittier, California

Scenario Timeframe:	Current/Future
Receptor Population:	Construction Worker - CTE
Receptor:	Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic HBRG (mg/kg)				Non-Carcinogenic Hazard HBRG (mg/kg)				Minimum HBRG mg/kg	
				Ingestion	Dermal	Inhalation of Fugitive Dust	Exposure Routes Min	Primary Target Organ(s)	Ingestion	Dermal	Inhalation of Fugitive Dust		Exposure Routes Min
Soil	Soil 0 to 30'	Soil 0 to 30'	BENZO(A)PYRENE	2.5E+01	1.4E+01	9.0E+05	1.4E+01	Liver toxicity in mice	---	---	---	---	1.4E+01
				5.5E+02	4.5E+02	3.0E+07	4.5E+02		4.3E+04	3.5E+04	2.3E+09	3.5E+04	4.5E+02

HBRG: Health based risk goal

NA: Not applicable.

---: Risk was not calculated for chemical.

mg/kg: milligram per kilogram.

CNS: Central Nervous System.

CTE: central tendency exposure

TABLE A5-2.4 RME  
 SUMMARY OF CARCINOGENIC AND NON-CARCINOGENIC HBRGS FOR COPCs BY EXPOSURE PATHWAY  
 Construction Worker - Reasonable Maximum Exposure  
 Omega Chemical Site - Whittier, California

Scenario Timeframe:	Current/Future
Receptor Population:	Construction Worker - RME
Receptor:	Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic HBRG (mg/kg)				Non-Carcinogenic Hazard HBRG (mg/kg)				Minimum HBRG mg/kg	
				Ingestion	Dermal	Inhalation of Fugitive Dust	Exposure Routes Min	Primary Target Organ(s)	Ingestion	Dermal	Inhalation of Fugitive Dust		Exposure Routes Min
Soil	Soil 0 to 30'	Soil 0 to 30'	BENZO(A)PYRENE	5.2E+00	1.4E+01	4.7E+05	5.2E+00	Liver toxicity in mice	---	---	---	---	5.2E+00
			TETRACHLOROETHENE	1.2E+02	4.5E+02	1.6E+07	1.2E+02		8.9E+03	3.5E+04	1.2E+09	8.9E+03	1.2E+02
			TRICHLOROETHENE	4.8E+03	1.9E+04	6.5E+08	4.8E+03		2.7E+02	1.0E+03	3.6E+07	2.7E+02	2.7E+02

HBRG: Health based risk goal

NA: Not applicable.

---: Risk was not calculated for chemical.

mg/kg: milligram per kilogram.

CNS: Central Nervous System.

RME: reasonable maximum exposure

TABLE A5-3.1 RME  
SUMMARY OF CARCINOGENIC AND NON-CARCINOGENIC HBRGS FOR COPCs  
All Receptors  
Omega Chemical Site - Whittier, California

Scenario Timeframe:	Current/Future
Receptor Population:	Industrial Worker and Construction Worker
Receptor:	Adult

Target Risk 1.0E-06  
Target Hazard 1.0E+00

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Units	HBRG for Exposure Point					HBRG For Original Medium		Comparison of Calculated HBRG to Existing Screening Level <sup>(1)</sup>	
					Industrial CTE	Industrial RME	Construction CTE	Construction RME	Receptor Minimum	Value	Units	Screening Level	Notes
Soil	Soil	Soil	BENZO(A)PYRENE	mg/kg	NA	NA	1.4E+01	5.2E+00	5.2E+00	5.2E+00	mg/kg	2.11E-01	OK
			BIS(2-ETHYLHEXYL)PHTHALATE	mg/kg	3.1E+02	3.1E+02	NA	NA	3.1E+02	3.1E+02	mg/kg	1.23E+02	OK
			DIELDRIN	mg/kg	NA	3.6E-01	NA	NA	3.6E-01	3.6E-01	mg/kg	1.08E-01	OK
			LEAD	mg/kg	NA	6.7E+02	NA	NA	6.7E+02	6.7E+02	mg/kg	8.00E+02	PRG less stringent
			NAPHTHALENE	mg/kg	NA	2.4E+01	NA	NA	2.4E+01	2.4E+01	mg/kg	4.20E+00	OK
			PCB-1254 (AROCLO 1254)	mg/kg	5.8E-01	5.8E-01	NA	NA	5.8E-01	5.8E-01	mg/kg	7.44E-01	PRG less stringent
			TETRACHLOROETHENE	mg/kg	NA	NA	4.5E+02	1.2E+02	1.2E+02	1.2E+02	mg/kg	1.31E+00	OK
TRICHLOROETHENE	mg/kg	NA	NA	NA	2.7E+02	2.7E+02	2.7E+02	mg/kg	6.47E+00	OK			
Indoor Air	Indoor Air	Indoor Air	1,1-DICHLOROETHENE	ug/m <sup>3</sup>	6.1E+02	6.1E+02	NA	NA	6.1E+02	6.1E+02	ug/m <sup>3</sup>	---	No CHHSL
			1,2-DICHLOROETHANE	ug/m <sup>3</sup>	3.3E-01	3.3E-01	NA	NA	3.3E-01	3.3E-01	ug/m <sup>3</sup>	1.95E-01	OK
			1,4-DICHLOROBENZENE	ug/m <sup>3</sup>	7.5E-01	7.5E-01	NA	NA	7.5E-01	7.5E-01	ug/m <sup>3</sup>	---	No CHHSL
			ACETONE	ug/m <sup>3</sup>	9.6E+03	9.6E+03	NA	NA	9.6E+03	9.6E+03	ug/m <sup>3</sup>	---	No CHHSL
			BENZENE	ug/m <sup>3</sup>	3.0E-01	3.0E-01	NA	NA	3.0E-01	3.0E-01	ug/m <sup>3</sup>	1.41E-01	OK
			CARBON TETRACHLORIDE	ug/m <sup>3</sup>	2.0E-01	2.0E-01	NA	NA	2.0E-01	2.0E-01	ug/m <sup>3</sup>	9.73E-02	OK
			CHLOROFORM	ug/m <sup>3</sup>	3.7E-01	3.7E-01	NA	NA	3.7E-01	3.7E-01	ug/m <sup>3</sup>	---	No CHHSL
			METHYLENE CHLORIDE	ug/m <sup>3</sup>	8.5E+00	8.5E+00	NA	NA	8.5E+00	8.5E+00	ug/m <sup>3</sup>	---	No CHHSL
			TETRACHLOROETHENE	ug/m <sup>3</sup>	1.4E+00	1.4E+00	NA	NA	1.4E+00	1.4E+00	ug/m <sup>3</sup>	6.93E-01	OK
			TOLUENE	ug/m <sup>3</sup>	9.1E+02	9.1E+02	NA	NA	9.1E+02	9.1E+02	ug/m <sup>3</sup>	4.38E+02	OK
TRICHLOROETHENE	ug/m <sup>3</sup>	4.3E+00	4.3E+00	NA	NA	4.3E+00	4.3E+00	ug/m <sup>3</sup>	2.04E+00	OK			

NA: Not applicable, not a COPC for the pathway or the receptor scenario

OK: indicates that HBRG is higher than screening level

HBRG: Health based risk goal

CHHSL: California Human Health Screening Level

PRG: Preliminary Remediation Goal

ug/m<sup>3</sup>: microgram per cubic meter.

ppbv: parts per billion by volume

ug/l: microgram per liter.

(1) Screening Levels were as follows:

Indoor air screening levels are CalEPA CHHSLs Indoor Air Screening Levels for Human Health Commercial/Industrial Use (EPA 2005).

Soil screening levels are EPA's Region 9 Preliminary Remediation Goals (PRGs) for industrial soil (EPA 2004c)

# Appendix B

## Arsenic Statistical Evaluation

PARAM_NAME	SAMPLE_ID	FROM_DEPTH	UNITS	VALUE	ANAL VALUE
ARSENIC	RT2526-110803		mg/kg	2.40	2.40
ARSENIC	SB-1-3.0-SOIL-12/12/1995	3	ug/Kg	3200.00	3.20
ARSENIC	SB-2-1.8-SOIL-12/11/1995	1.8	ug/Kg	3700.00	3.70
ARSENIC	SB-3-1.7-SOIL-12/12/1995	1.7	ug/Kg	3400.00	3.40
ARSENIC	SB-4-1.6-SOIL-12/11/1995	1.6	ug/Kg	4000.00	4.00
ARSENIC	SB-5-1.8-SOIL-12/11/1995	1.8	ug/Kg	4700.00	4.70
ARSENIC	SB-6-2.1-SOIL-12/12/1995	2.1	ug/Kg	4500.00	4.50
ARSENIC	SB-7-1.7-SOIL-12/11/1995	1.7	ug/Kg	4200.00	4.20
ARSENIC	SB-8-2.1-SOIL-12/12/1995	2.1	ug/Kg	3100.00	3.10
ARSENIC	SB-9-1.8-SOIL-12/13/1995	1.8	ug/Kg	1800.00	1.80
ARSENIC	SB-9-5.9-SOIL-12/13/1995	5.9	ug/Kg	810.00	0.81
ARSENIC	12/14/1995	2.2	ug/Kg	1400.00	1.40
ARSENIC	12/14/1995	1.8	ug/Kg	2100.00	2.10
ARSENIC	12/14/1995	6.5	ug/Kg	2200.00	2.20
ARSENIC	12/11/1995	1.7	ug/Kg	9000.00	9.00
ARSENIC	12/11/1995	6.5	ug/Kg	3100.00	3.10
ARSENIC	12/12/1995	1.8	ug/Kg	3500.00	3.50
ARSENIC	12/11/1995	1.8	ug/Kg	6600.00	6.60
ARSENIC	12/11/1995	1.7	ug/Kg	3200.00	3.20
ARSENIC	OCSS-000-01-040504	0	mg/kg	21.00	21.00
ARSENIC	OCSS-000-02-040504	0	mg/kg	6.00	6.00
ARSENIC	OCSS-000-03-040504	0	mg/kg	3.00	3.00
ARSENIC	OC1-000-04-S-0-5	0.5	mg/Kg	5.50	5.50
ARSENIC	OC-SS-000-04-040504	0	mg/kg	3.00	3.00
ARSENIC	OCSS-000-05-040504	0	mg/kg	3.00	3.00
ARSENIC	OCSS-000-06-040504	0	mg/kg	8.70	8.70
ARSENIC	OCSS-000-07-040504	0	mg/kg	6.60	6.60
ARSENIC	OCSS-000-08-040504	0	mg/kg	6.40	6.40
ARSENIC	OC-SS-000-09-040504	0	mg/kg	5.50	5.50
ARSENIC	OC-SS-000-10-040504	0	mg/kg	4.00	4.00
ARSENIC	OC-SS-000-11-040504	0	mg/kg	6.20	6.20
ARSENIC	OC1-000-12-S-0-7	0.5	mg/Kg	6.30	6.30
ARSENIC	OC-SS-000-12-040504	0	mg/kg	5.00	5.00
ARSENIC	OC-SS-000-13-040504	0	mg/kg	7.70	7.70
ARSENIC	OC-SS-000-14-040504	0	mg/kg	5.80	5.80
ARSENIC	OC-SS-000-15-040504	0	mg/kg	4.00	4.00
ARSENIC	OC-SS-000-16-040504	0	mg/kg	6.10	6.10
ARSENIC	OC-SS-000-17-040604	0	mg/kg	5.10	5.10
ARSENIC	OC-SS-000-18-040604	0	mg/kg	5.50	5.50
ARSENIC	OC-SS-000-19-040604	0	mg/kg	5.10	5.10
ARSENIC	OC-SS-000-20-040604	0	mg/kg	4.00	4.00

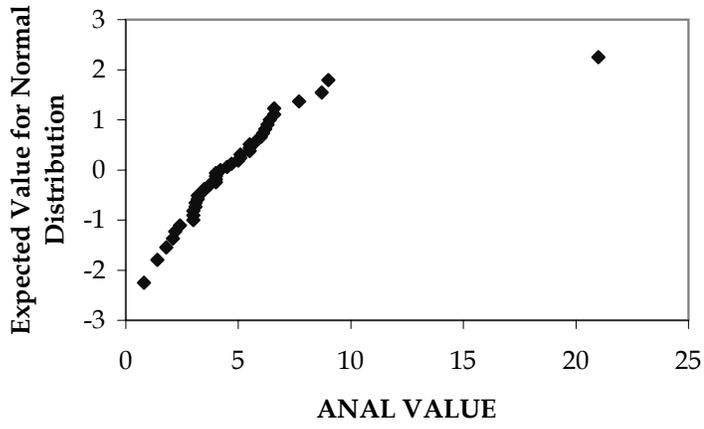
LN ANAL VALUE
0.88
1.16
1.31
1.22
1.39
1.55
1.50
1.44
1.13
0.59
-0.21
0.34
0.74
0.79
2.20
1.13
1.25
1.89
1.16
3.04
1.79
1.10
1.70
1.10
1.10
2.16
1.89
1.86
1.70
1.39
1.82
1.84
1.61
2.04
1.76
1.39
1.81
1.63
1.70
1.63
1.39

BINS	FREQ
1	1
2	2
4	17
6	11
8	7
10	2
15	0
20	0
>20	1

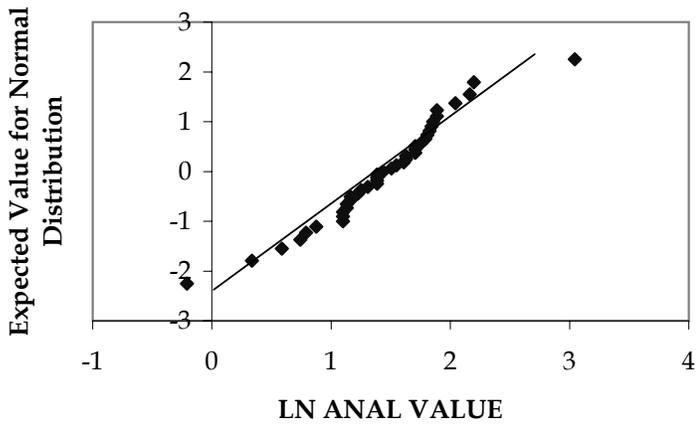
ANAL VAL	Expected
0.81	-2.250926
1.4	-1.791764
1.8	-1.546635
2.1	-1.369856
2.2	-1.227826
2.4	-1.107003
3	-1.000491
3	-0.904267
3	-0.815766
3.1	-0.733236
3.1	-0.655424
3.2	-0.581393
3.2	-0.510422
3.4	-0.441935
3.5	-0.375462
3.7	-0.310609
4	-0.247039
4	-0.184452
4	-0.122581
4	-0.061175
4.2	-1.39E-16
4.5	0.061175
4.7	0.122581
5	0.184452
5.1	0.247039
5.1	0.310609
5.5	0.375462
5.5	0.441935
5.5	0.510422
5.8	0.581393
6	0.655424
6.1	0.733236
6.2	0.815766
6.3	0.904267
6.4	1.000491
6.6	1.107003
6.6	1.227826
7.7	1.369856
8.7	1.546635
9	1.791764
21	2.250926

LN ANAL	Expected
-0.210721	-2.250926
0.336472	-1.791764
0.587787	-1.546635
0.741937	-1.369856
0.788457	-1.227826
0.875469	-1.107003
1.098612	-1.000491
1.098612	-0.904267
1.098612	-0.815766
1.131402	-0.733236
1.131402	-0.655424
1.163151	-0.581393
1.163151	-0.510422
1.223775	-0.441935
1.252763	-0.375462
1.308333	-0.310609
1.386294	-0.247039
1.386294	-0.184452
1.386294	-0.122581
1.386294	-0.061175
1.435085	-1.39E-16
1.504077	0.061175
1.547562	0.122581
1.609438	0.184452
1.629241	0.247039
1.629241	0.310609
1.704748	0.375462
1.704748	0.441935
1.704748	0.510422
1.757858	0.581393
1.791759	0.655424
1.808289	0.733236
1.824549	0.815766
1.84055	0.904267
1.856298	1.000491
1.88707	1.107003
1.88707	1.227826
2.04122	1.369856
2.163323	1.546635
2.197225	1.791764
3.044523	2.250926

**Normal Probability Plot**



**Normal Probability Plot**



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*ANAL VALUE*

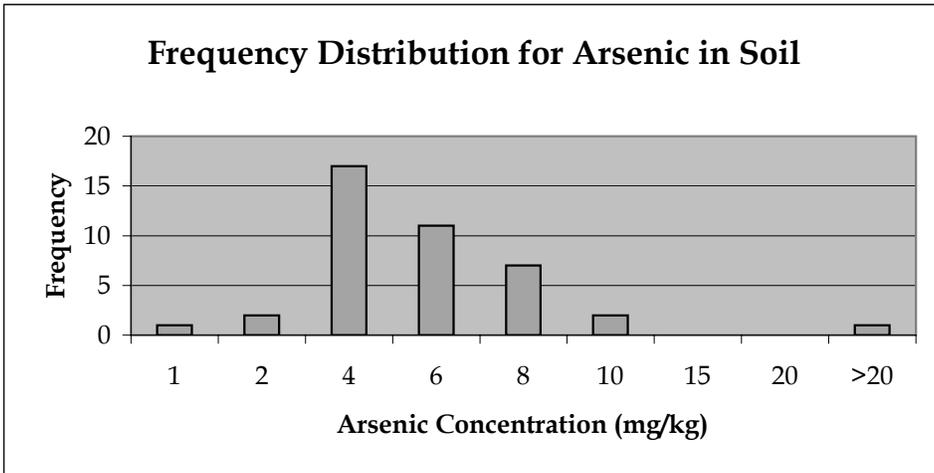
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Mean	4.888049
Standard Error	0.498316
Median	4.2
Mode	4
Standard Deviation	3.190777
Sample Variance	10.18106
CV	0.652771
Kurtosis	16.02464
Skewness	3.320813
Range	20.19
Minimum	0.81
Maximum	21
Sum	200.41
Count	41
Confidence Level(95.0%)	1.007133

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Outliers (k)	Samples (n)	Mean (n-k-1)	StDev (n-k-1)	ANAL VALUE (k-1)	Rosner R Stat	Rosner p-value
1	41	4.888048649	3.190776587	21	5.049539089	0.000473251
2	40	4.485249996	1.902477145	9	2.373090267	0.098661259
3	39	4.369487286	1.778909683	8.7	2.434363365	0.087795831
4	38	4.255526543	1.652229071	0.81	2.085380793	0.11661306
5	37	4.348649025	1.57067132	7.7	2.133706093	0.105576366